

# ON THE TRICHOPTERA OF ETHIOPIA

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## SYNOPSIS

A study of collections made by Dr. A. Tjønneland and others has resulted in raising the number of species recorded from Ethiopia to fifty-one, of which seventeen are here described as new. The genus *Hydropsychodes* Ulmer has been placed as a synonym of *Cheumatopsyche* Wallengren.

UNTIL Dr. A. Tjønneland began collecting with the aid of a mercury vapour light trap, the trichopteran fauna of Ethiopia was almost unknown. A selection of his catches, together with collections made by two of his colleagues and by Mr. Bob G. Hill in the Dire Dawa district, form the subject of this study. They have increased the number of species recorded to fifty-one, of which seventeen are here described as new.

Despite this considerable addition to the known fauna, much of the country is still unworked and it is probable that further representatives of families of Trichoptera which occur elsewhere in Africa remain to be discovered. These include the Rhyacophilidae, Philopotamidae, Polycentropodidae, Hydroptilidae, Calamoceratidae, Leptoceridae and Lepidostomatidae.

Of the species now known to occur in Ethiopia, eleven are found also in East Africa, seven extend into West Africa and five are widespread African species. One species was originally described from SW. Arabian material and another is closely allied to a species from that area.

The author wishes to express his thanks to Dr. A. Tjønneland, of University College of Addis Ababa, for the opportunity of working on this collection and for allowing the British Museum (Natural History) to retain most of it, including the holotypes and allotypes. Paratypes, where available, and named duplicates have been returned to the University College of Addis Ababa. Dr. Tjønneland has also made collections of Ephemeroptera in Ethiopia, which it is hoped to deal with in due course.

In the present paper, to save space, in recording localities the word ETHIOPIA has been omitted. In indicating the location of types and paratypes, the abbreviations (BMNH) and (UCAA) have been used for the British Museum (Natural History) and the University College of Addis Ababa respectively.

## Family PHILOPOTAMIDAE

### *Chimarra abyssinica* Banks

*Chimarra abyssinica* Banks, 1913 : 235, (♀) ; Ulmer, 1930 : 479-482, figs. 1-3, (♂).

Gamo Province, Gughé Highlands, Bonghé, c. 9,000 ft., 29.xii.1948, from foliage of willows and flood refuse by stream in flat valley, 1 ♂, 1 ♀ ; Chench, c. 8,900 ft.,

30.xi.1948, from springs full of water plants in valley NE. of camp, 1 ♀ (*H. Scott*); Dire Dawa district, 5,000–8,000 ft., 2 ♂, 1 ♀ (*B. G. Hill*).

Previous known distribution: ETHIOPIA.

### *Chimarra lejea* Mosely

*Chimarra lejea* Mosely, 1948: 75–76, figs. 17–22.

Wondo Abella, warm stream, 24.iv.1960, 1 ♂, 1 ♀ (*A. Tjønneland*).

Previous distribution: WESTERN ADEN PROTECTORATE and YEMEN.

Dr. Tjønneland also collected some *Chimarra* larvae at the same locality, which may possibly belong to this species.

### *Chimarra triangularis* sp. n.

(Text-figs. 1–6)

(In alcohol.) Head, pronotum and patagia yellow (possibly orange in life) with golden hairs and a few black setae above the eyes. On the vertex is a fuscous triangle, apex forward, the angles at the ocelli. Antennae fuscous, with faint, paler annulations. Palpi pale fuscous. Meso- and metathorax fuscous, paler at the sides, mesoscutellar warts yellowish brown. Legs fuscous, posterior femora with a paler area beneath. Tibial spurs 1.4.4. Abdomen pale fuscous, terminal segments darker.

Wings pale fuscous, with fuscous pubescence. In fore wing with small hyaline areas surrounding the *r-m* and *m* cross-veins, the base of the median cell and the arculus. Veins otherwise fuscous. *Rs* distinctly sinuous before discoidal cell, which is subquadrangular. In hind wing, *Rs* is complete.

♂ GENITALIA. Eighth segment more strongly pigmented than preceding ones. Ninth with a strong, laterally compressed, triangular ventral process arising from the apical ventral margin. Side-pieces broadly triangular. Dorsum of ninth segment largely membranous, apart from a basal rib. Tenth tergite forming a pair of convex, lateral plates, about as long as the claspers, and partly enclosing the aedeagus on either side. In side view, each tapers to a rounded apex and from the upper margin arises a slender, digitate process, directed caudad. On each side of the tenth tergite, at the base, is a small, clavate cercus, set with setae. Aedeagus cylindrical, arising from a stout base, filled with membrane and enclosing two pairs of hooks or spines, and two single ones. Claspers in ventral view caliper-like, outer surfaces convex, inner hollowed, tapering to short, truncate apices. There is a short, internal branch at the base of each clasper.

♀ GENITALIA. Seventh sternite with a small, acute ventral process. Eighth segment synscleritous, apical margins blackened and serrate, ventral margins somewhat produced. Ninth tergite and sternite lightly sclerotized, the tergite with long, slender apodemes. Tenth tergite small.

Length of fore wing, ♂, 5.25 mm., ♀, 6.5 mm.

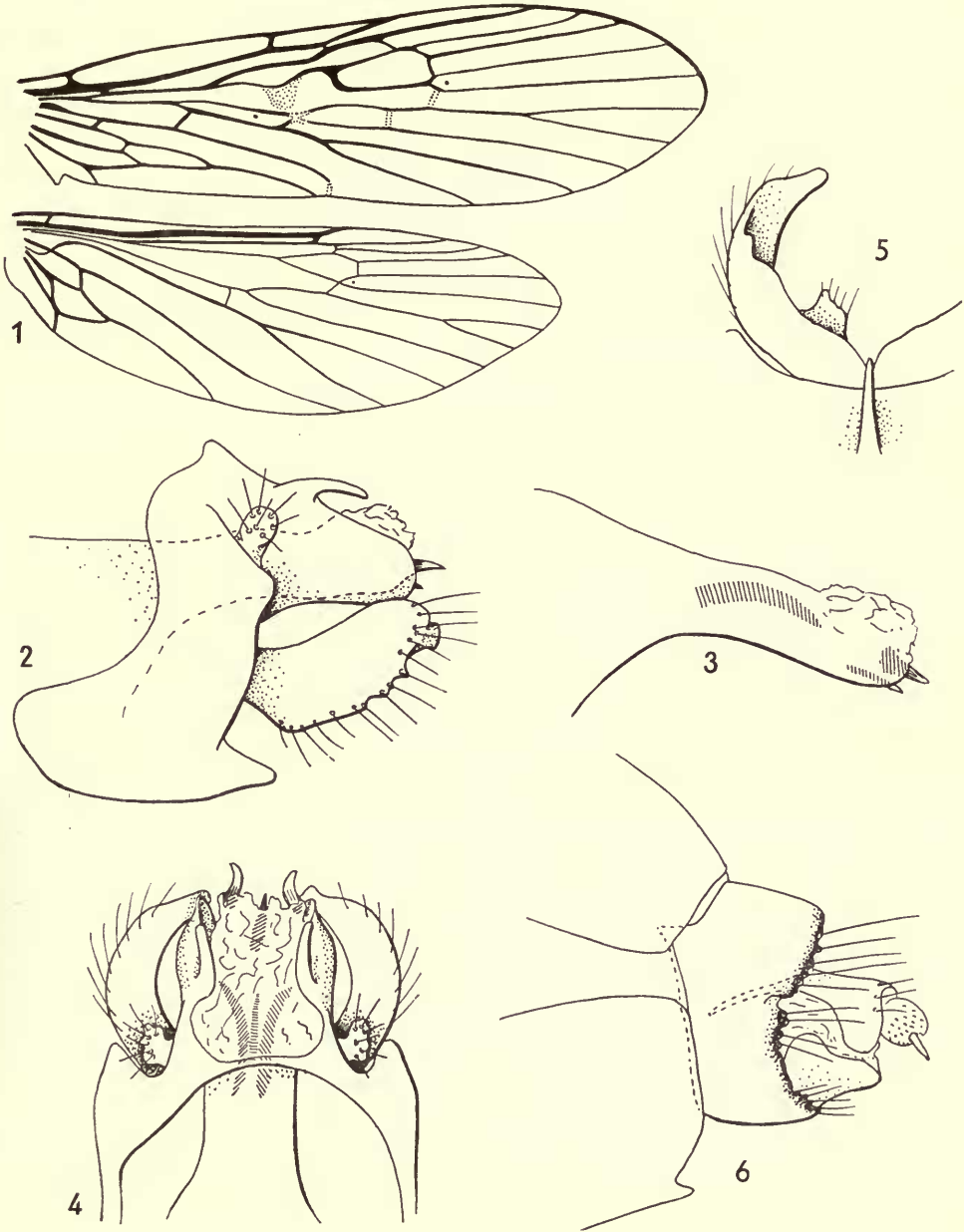
Holotype ♂, Gojeb River, 10.iv.1961 (*G. Hodera*), BMNH, mounted as microscope preparations.

Allotype ♀, Gojeb River, 10.iv.1961 (*G. Hodera*), BMNH, in 2% formaldehyde solution, abdomen mounted as microscope preparation.

Paratypes, Gojeb River, 10.iv.1961, 2 ♂, 12 ♀ (*G. Hodera*); stream near Gofa village, 15 km. from Adolla, 14.iv.1961, 17 ♂, 10 ♀; ?Sokorro stream, Wodorro village, 22–23.iv.1961, 1 ♀ (*A. Tjønneland*), BMNH, UCAA.

This species is related to *C. rhodesi* Kimmins (S. Rhodesia) in the general pattern of the male genitalia. It differs in the more developed tenth tergite, which more

fully encloses the stem of the aedeagus and in the dorsal processes of the tergite. The claspers are stouter in side view and have a stronger inner branch. There is no ventral process on the eighth segment in the male.



FIGS. 1-6. *Chimarra triangularis* sp. n. 1, ♂ wings; 2-6, genitalia; 2, ♂ lateral; 3, ♂ aedeagus, lateral; 4, ♂ dorsal; 5, ♂ left clasper, ventral; 6, ♀ genitalia, lateral.

## Family POLYCENTROPODIDAE

*Dipseudopsis capensis* Walker

Gofa village, 15 km. S. of Adolla, 17.iv.1960, 1 ♂; near Lake Shala, 25.iv.1960, 1 ♀; Koka Dam, 29.iii.1961, 3 ♂; Lake Margherita, 8-9.iv.1961, numerous ♂, ♀ (*A. Tjønneland*).

Widely distributed in Africa.

## Family PSYCHOMYIIDAE

## Subfamily ECNOMINAE

*Ecnomus thomasseti* Mosely

*Ecnomus thomasseti* Mosely, Kimmins, 1957a : 266, fig. 2, T.

Lake Awasa, 6, 27.xi.1960; Lake Langano, 7.iv.1961; Lake Margherita, 8-9.iv.1961 (*A. Tjønneland*).

This widely distributed African species was taken in small numbers.

*Ecnomus ugandanus* Kimmins

Kimmins, 1957a : 263, fig. 2, U.

Lake Awasa, 6, 27.xi.1960, small numbers; Koka Dam, 29.iii.1961, 7 ♂ (*A. Tjønneland*).

Previous distribution : UGANDA, TANGANYIKA.

*Ecnomus hilli* sp. n.

(Text-figs. 7-11)

(In alcohol.) Spurs 3.4.4. Head fuscous, with piceous pubescence. Antennae pale brownish, basally finely annulated with fuscous. Palpi dark fuscous. Thorax dark reddish brown, sides paler. Legs fuscous, anterior paler. Wings fuscous, with dark reddish brown pubescence.  $R_1$  in fore wing forked. Abdomen pale fuscous, terminal segments darker.

♂ GENITALIA. Lobes of tenth segment moderately elongate, tapering slightly towards the truncate apices in side view, with rounded angles. Internal black teeth forming a group about midway along upper margin. Basal process short, stout, slightly curved. Aedeagus long, stout about midway in side view, then tapering to a fine, spiniform apex. On its upper surface, at the widest part, arises a short, bifurcate process, directed caudad. Clasper about as long as lobe of tenth tergite, in side view about half as deep as sternite at its base, dilating to about midway and then tapering to a rounded apex. From beneath, the clasper is wide basally, its inner ventral margin semicircularly excised in apical half to form a caliper-like process.

♀ GENITALIA. Eighth sternite divided almost to its base to form two quadrate, lateral plates, the sternite between them reduced to a shallow, rounded lobe. The lateral plates are a little longer than eighth tergite, extending about to apex of ninth tergite.

Length of fore wing, ♂, ♀, 7 mm.

Holotype ♂, Dire Dawa district, 5,000-8,000 ft., 1961 (*B. G. Hill*), BMNH, mounted as microscope preparations.



Allotype ♀, Dire Dawa district, 5,000–8,000 ft., 1961 (*B. G. Hill*), BMNH, in 2% formaldehyde solution, abdomen mounted as microscope preparation.

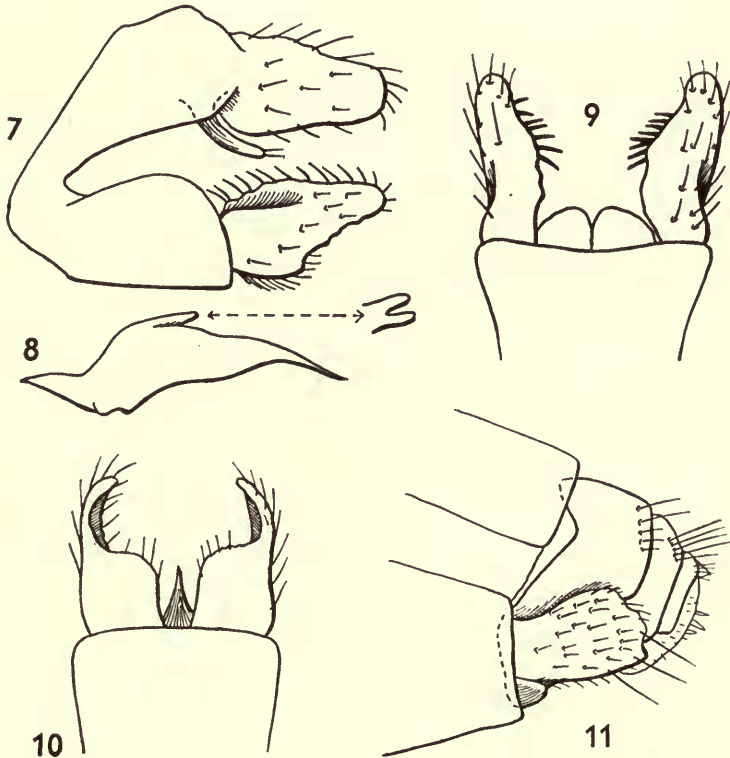
Paratypes, Dire Dawa district, 5,000–8,000 ft., 1961, 16 ♂, 13 ♀ (*B. G. Hill*), BMNH and UCAA.

In male genitalia, this species resembles *E. katangae* Jacquemart in having short basal processes to the lobes of the tenth segment and a slender, somewhat sinuous aedeagus without titillators (unless the bifurcate process can be considered as fused titillators). It differs in the shape of the lobe of the tenth segment, and lacks the "coral process" on that segment. Jacquemart does not indicate any dorsal process on the aedeagus. The claspers are shorter and stouter than in *katangae*. Jacquemart does not show the radius in the anterior wing forked at its apex, but this fork is sometimes somewhat obscure. The female is only provisionally associated with the male.

*Ecnomus similis* Mosely

Koka Dam, 29.iii.1961, 9 ♂ (*A. Tjønneland*).

Previous distribution : S. AFRICA, NYASALAND.



FIGS. 7–11. *Ecnomus hilli* sp. n. Genitalia. 7, ♂ lateral; 8, ♂ aedeagus, lateral; 9, ♂ tenth segment, dorsal; 10, ♂ claspers and aedeagus, ventral; 11, ♀ lateral.

*Ecnomus* sp.

Lake Awasa, 6.xi.1960, 1 ♂ (*A. Tjønneland*).

This male is freshly emerged and lacking in pigmentation. From the male genitalia, it appears to be an undescribed species related to *E. hilli* sp. n., but in view of the limited material it is not proposed to give it a name.

*Ecnomus* spp. ♀♀

Lake Awasa, 6.xi.1960, numerous ex. ; Koka Dam, 29.iii.1961, numerous ex. (*A. Tjønneland*).

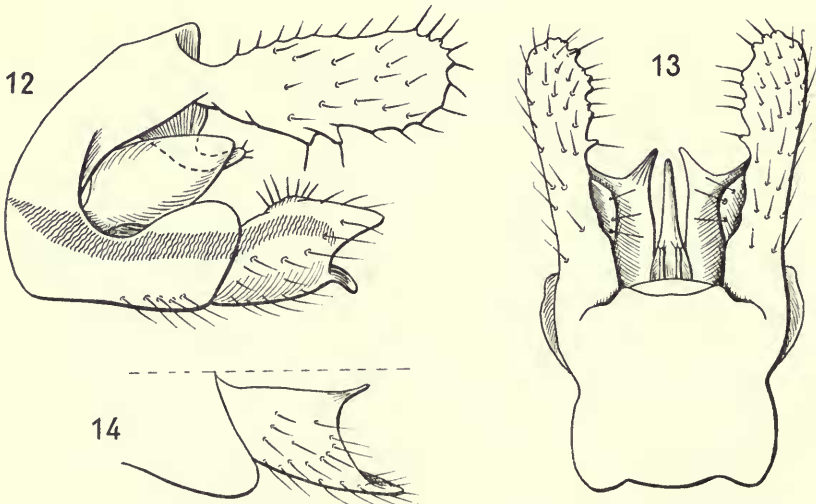
In the absence of definitely associated males, the *Ecnomus* females are left undetermined.

*Psychomyiellodes excavata* sp. n.

(Text-figs. 12-14)

♂ (in alcohol). Head pale fuscous, warts darker, pubescence piceous. Basal segment of antennae fuscous, remaining segments ochraceous, with sparse fuscous pubescence. Palpi fuscous. Thorax fuscous above, ochraceous on sides and beneath. Legs ochraceous, tibiae and tarsi darker or obscured by fuscous pubescence, posterior femora with a sub-basal, fuscous ring. Inner apical spur of hind tibia with apical claw. Wings pale fuscous, with fuscous pubescence. Venation typical of genus.

♂ GENITALIA. Ninth segment with a deep lateral excision. Dorsal apical margin slightly produced at its centre, tenth segment excised to its base to form a pair of long, flattened processes, concave internally. From the side, each process is constricted basally, upper margin sinuous, lower with one or two tooth-like projections about midway, apex rounded. From above, the upper dorsal margin is also somewhat serrate. The inner, digitate process is rather short, directed downwards and then caudad, terminating in about three setae. Aedeagus



FIGS. 12-14. *Psychomyiellodes excavata* sp. n. ♂ Genitalia. 12, lateral; 13, dorsal; 14, right clasper, ventral.

slender, sinuous in side view, very slender apically in dorsal aspect. On each side, situated in the lateral excision of the ninth segment, is the usual scoop-like process or titillator. Clasper single-segmented, its apical margin more deeply excavated than in *P. obscura*, ovate rather than triangular in side view, and with the produced, inner apical angle appearing as a downturned hook.

Length of fore wing, ♂, 3.5 mm.

Holotype ♂, Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961 (*A. Tjønneland*), BMNH, mounted as microscope preparations.

This species comes nearest to *P. obscura* Kimmins, from which it may be distinguished by the different shape of the tenth segment, the more curved digitate processes and the different shapes of the ninth sternite and claspers.

### *Psychomyiellodes obscura* Kimmins

Kimmins, 1957a : 270, figs. 1, D, 4.

Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961, 1 ♂ (*A. Tjønneland*).

Previous distribution : UGANDA, RHODESIA.

A single *Ecnomine* female from the same locality is placed as a *Psychomyiellodes*, since no *Ecnomus* were taken at the same time. I do not know of any reliable characters by which to separate the females of these two genera.

### Subfamily PSYCHOMYIINAE

#### *Abaria electa* Marlier

Marlier, 1960 : 85.

Wolamo Prov., Mt. Damota, over 10,000 ft., 5.xi.1948, from moss on wet rock-face of spring, 2 ♂ (*H. Scott*).

These specimens agree in venation and genital structure better with *A. electa* than with *A. tripunctata* Mosely (Aden and Yemen). Both species are, however, very closely related and further material may prove that they are at most only of sub-specific rank.

Previous distribution : CONGO.

### Family HYDROPSYCHIDAE

#### Subfamily OESTROPSINAE

#### *Amphipsyche senegalensis* (Brauer)

For references see Kimmins, 1962 : 85.

Koka Dam, 29.iii.1961 ; Lake Margherita, 8-9.iv.1961 ; Dawa River, 12 km. N. of Hudat, 12.iv.1961 (*A. Tjønneland*).

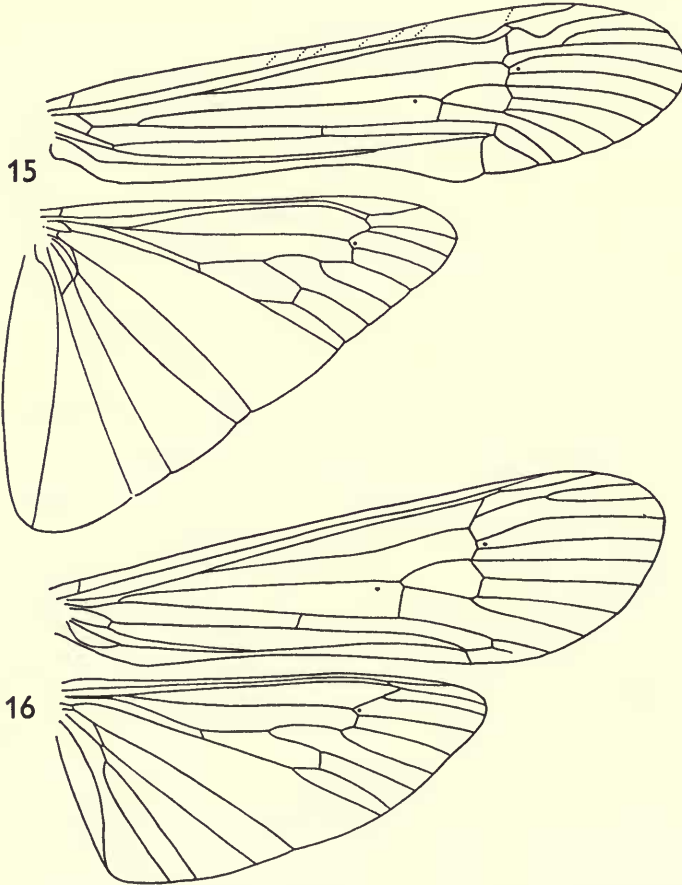
Females from Koka Dam show a variation in the spur formula of the median tibiae, the pre-apical spurs being small or absent. Thus the spur formula may be 0.4.2, 0.3.2 or 0.2.2.

*Amphipsyche instabilis* sp. n.

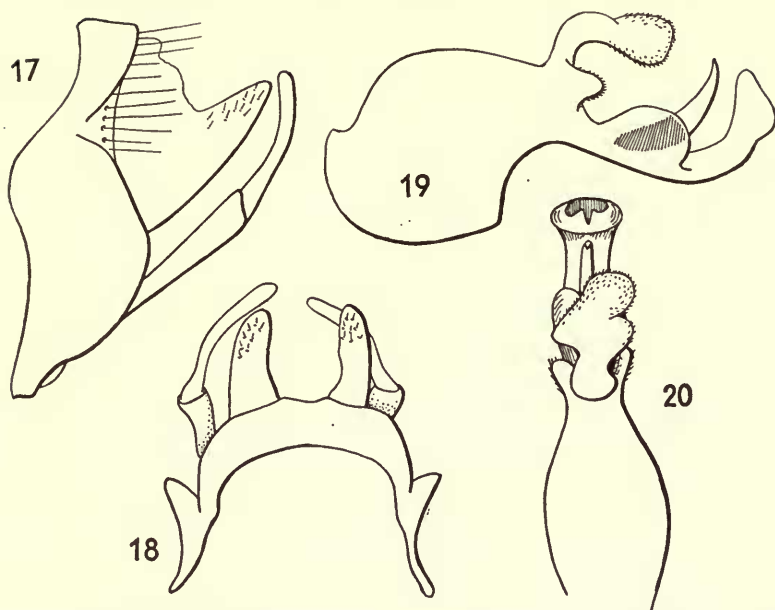
(Text-figs. 15-23)

♂ (in alcohol). General colour of head and thorax tawny yellow, abdomen paler, faintly marked with purplish. Antennae pale luteous basally, narrowly annulated with reddish at the articulations, the segments becoming progressively more shaded with fuscous towards the apices. Palpi and legs luteous, tibial spurs 0.4.2. Fore wing pale tawny yellow, veins pale, venation resembling that of *A. berneri* Kimmins, but the apex of the wing is less dilated and the apical cells consequently narrower. Hind wing hyaline, very wide at base. The venation in the apical part of the wing is somewhat unstable, the cross-vein linking  $R_5$  and  $M_1$  sometimes incomplete or absent; veins  $R_4$  and  $M_{3+4}$  are also sometimes incomplete. There is also an additional cross-vein linking  $M_{3+4}$  with  $Cu_{1a}$  in all the specimens examined, as in the type species, *Amphipsyche proluta* McLachlan. Cell  $R_{2+3}$  is sessile.

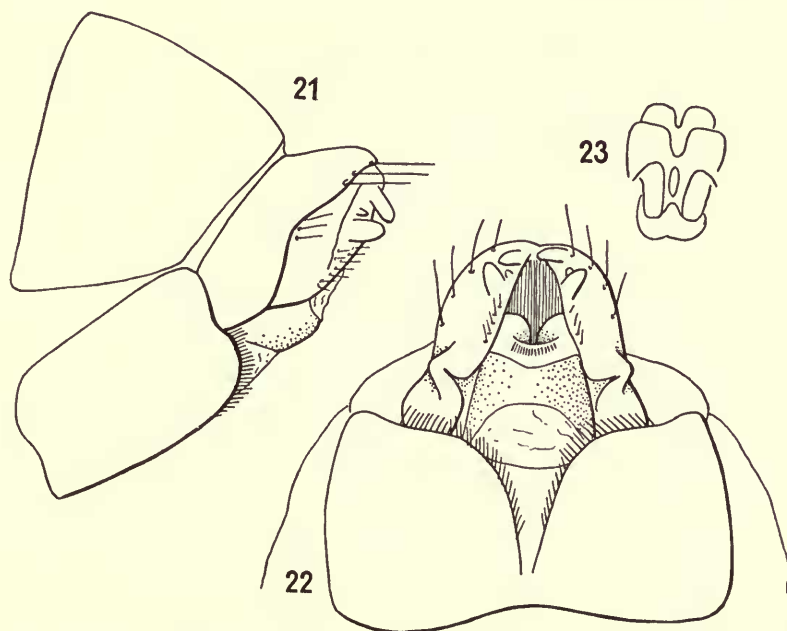
♂ GENITALIA in general appearance not easily distinguished from other species in the genus. The aedeagus is however very distinctive. At about midway along the dorsal surface arises a somewhat clavate process, its short, slender stem directed upwards, the flattened, irregularly-shaped apex bent apically at right angles and clothed with minute, tooth-like rugosity. The



FIGS. 15-16. *Amphipsyche instabilis* sp. n. Wings. 15, ♂; 16, ♀.



FIGS. 17-20. *Amphipsyche instabilis* sp. n. ♂ Genitalia. 17, lateral; 18, dorsal; 19, aedeagus, lateral; 20, the same, dorsal.



FIGS. 21-23. *Amphipsyche instabilis* sp. n. ♀ Genitalia. 21, lateral; 22, ventral; 23, vaginal structure, ventral.



shape of the apex varies in individuals. On each side of this process, at its base, is a small, rounded lobe, similarly rugose. Beyond this dorsal process the aedeagus is slender, its sides produced upwards in rounded, incurved lobes on each side of the parameres. In this species, the two parameres are fused into a single, curved median spine.

♀ (in alcohol). The solitary female is associated with the males chiefly upon the presence of the cross-veins linking  $M_{3+4}$  with  $Cu_{1a}$  in the hind wing. It is similarly coloured, but with much shorter wings. In the fore wing,  $Rs$  is slightly sinuous.

♀ GENITALIA. Lobes of eighth sternite moderately long, plate-like, their inner apical angles in ventral view broadly rounded, inner margins almost meeting basally. Ninth tergite forming a short hood, clasper groove inconspicuous. Ninth sternite forming a lightly pigmented, transverse plate, its apex shallowly excised.

Length of fore wing, ♂, 12.5 mm., ♀ 9 mm.

Holotype ♂, Dawa River, 12 km. N. of Hudat, 12.iv.1961 (*A. Tjønneland*), BMNH, mounted as microscope preparations.

Allotype ♀, Dawa River, 12 km. N. of Hudat, 12.iv.1961 (*A. Tjønneland*), BMNH, in 2% formaldehyde solution, one pair of wings and abdomen mounted as microscope preparations.

Paratypes, Dawa River, 12 km. N. of Hudat, 12.iv.1961, 34 ♂ (*A. Tjønneland*), BMNH, UCAA. N. RHODESIA, Zambezi, Katambora, x.1960, 2 ♂, iv.1962, 10 ♂ (*Nat. Mus. S. Rhodesia*), BMNH, NAT. MUS. S. RHOD.

This species somewhat resembles *A. berneri* Kimmins (1962: 91) from Ghana, but may be distinguished in the males by the dorsal process on the stem of the aedeagus and by the parameres fused to form a single spine. Both sexes are distinguished from other described African species by the cross-vein linking  $M_{3+4}$  and  $Cu_{1a}$  in the hind wing.

### *Amphipsyche fuscata* sp. n.

(Text-figs. 24-29)

♂ (in alcohol). Head and thorax tawny yellow. Antennae at bases luteous, fairly rapidly shading into fuscous, segments annulated with reddish at articulations. Palpi and legs luteous, tibial spurs 0.4.2. Abdomen creamy, with faint purplish markings. Fore wing mainly hyaline, with pale luteous veins. In well-marked specimens there is a distinct fuscous cloud at apex of median cell and base of cell  $Cu_{1a}$  and a band of fuscous between the posterior margin and the anal vein.  $R_{2+3}$  is fairly widely separated from  $R_4$ , and  $Rs$  is straight or slightly sinuous towards its apex. Hind wing hyaline, veins pale, apical cell  $R_2$  sessile.

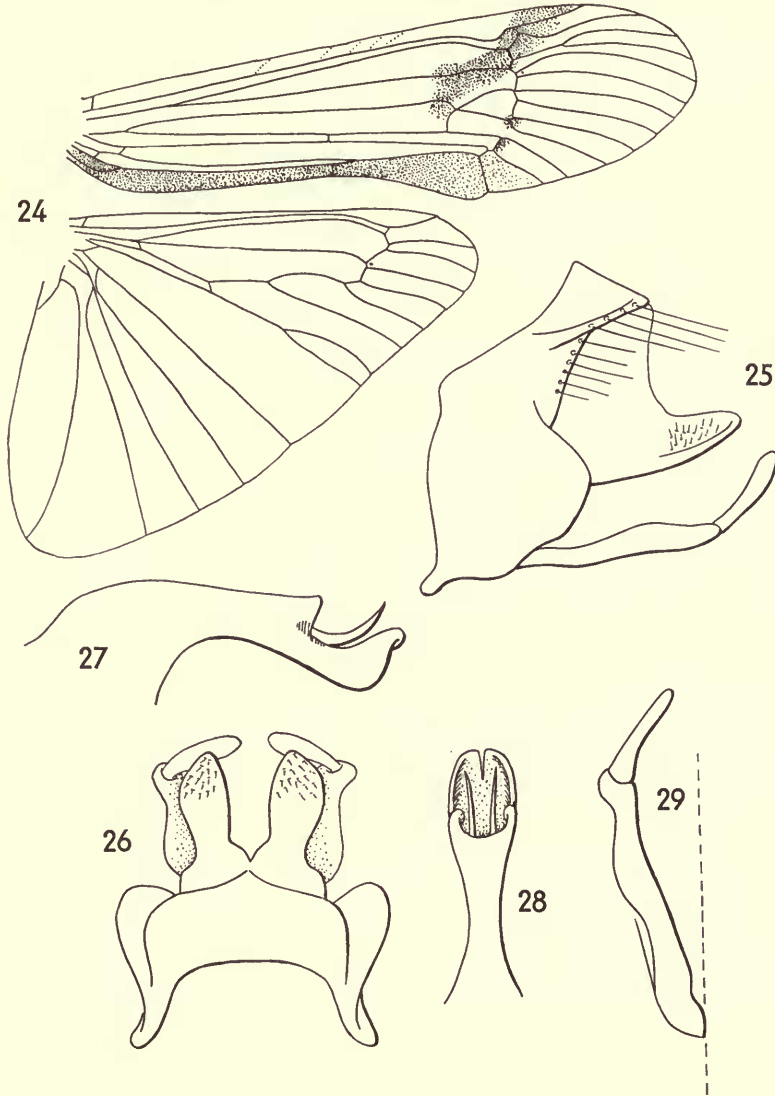
♂ GENITALIA. Ninth tergite slightly produced at the centre of its apical margin. Lobes of tenth segment moderately upturned, flattened, in dorsal view with a deep excision between them almost to the base. Each lobe is widest at about two-thirds from its base, constricted near the base and tapering to a rounded apex. Aedeagus with two slender, upcurved, spiniform parameres, slightly divergent in dorsal view. In side view, the aedeagus is narrowed near the base by a vertical excision of the dorsal margin, which then sweeps up to a rounded apex. Ventral margin convexly rounded before apex. From above, the apical margin is rounded, with a narrow, median excision. Clasper in ventral view with basal segment dilated beyond middle, then constricted and finally becoming clavate apically.

Length of fore wing, ♂, 17 mm.

Holotype ♂, Koka Dam, 29.iii.1961 (*A. Tjønneland*), BMNH, mounted as microscope preparations.

Paratypes, Koka Dam, 29.iii.1961, 4 ♂; Dawa River, 12 km. N. of Hudat, 12.iv.1961, 4 ♂; Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961, numerous ♂ (*A. Tjønneland*), BMNH, UCAA.

This species somewhat resembles *A. corbeti* Kimmins (1962 : 89), but the lobes of the tenth segment are more clavate in dorsal view, the aedeagus is more slender and the parameres are smaller. The basal segment of the clasper is sinuous and more dilated in ventral view. The amount of pattern on the fore wing of *A. fuscata* is subject to variation and some examples have the wings almost unmarked.



FIGS. 24-29. *Amphipsyche fuscata* sp. n. 24, ♂ wings; 25-29, ♂ genitalia; 25, lateral; 26, dorsal; 27, aedeagus, lateral; 28, the same, dorsal; 29, left clasper, ventral.

Subfamily **HYDROPSYCHINAE**THE GENERA *CHEUMATOPSYCHE* WALLENGREN AND  
*HYDROPSYCHODES* ULMER

Ulmer (1951 : 224-226) has discussed the status of these two genera at some length and, in dealing with the fauna of the Sunda Islands, he decided to keep the two genera separate, whilst admitting that they were closely related. He used the presence of fork  $R_2$  in the hind wing, the form of the tenth tergite of the male and certain larval differences to distinguish *Cheumatopsyche* from *Hydropsychodes*, in which fork  $R_2$  is wanting in the hind wing. Dr. Ulmer is far better qualified than the writer to assess the value of the larval characters he mentions, but one needs to know the larvae of many more species to be sure of the constancy of these characters.

In the type-species of *Cheumatopsyche* (*Hydropsyche lepida* Pictet), fork  $R_2$  in the hind wing varies in size and may be completely absent. The form of the tenth tergite in the male does not appear to me to be so very different from that of some of the African species (*falcifera* Ulmer, for example), which was placed by Ulmer in his genus *Hydropsychodes* on the absence of fork  $R_2$  in the hind wing. It is admitted that the typical species of *Hydropsychodes* (*Hydropsychodes albomaculata* Ulmer) is of very different general appearance from *Ch. lepida* (Pictet), the wings being dark, with white markings, and the median cell is generally open in the fore wing. Ulmer himself (in a letter to Mosely in 1935) drew attention to the fact that this cell was erroneously shown as closed in his original description (1905 : 34. fig. 22), and this open cell is confirmed by a paratype of *C. albomaculata* (Ulmer). The open median cell of the fore wing cannot, however, be considered as a stable generic character, since Jacquemart (1957 : fig. 84) shows a closed median cell in *albomaculata* and the open median cell is a variable character in another species (*Ch. simplex* sp. n.). The male genitalia of *albomaculata* are extraordinarily like those of *Ch. lesnei* (Mosely), which has a closed median cell in the yellowish brown, irrorated fore wings.

We are thus left with no really reliable adult characters by which to separate these two genera, and I am therefore placing *Hydropsychodes* Ulmer in the synonymy of *Cheumatopsyche* Wallengren.

**CHEUMATOPSYCHE** Wallengren

*Cheumatopsyche* Wallengren, 1891 : 142. Type species (monobasic), *Hydropsyche lepida* Pictet, 1834.

*Hydropsychodes* Ulmer, 1905 : 34, **syn. n.** Type species (by designation of Mosely, 1939 : 27), *Hydropsychodes albomaculata* Ulmer, 1905.

*Ulmeria* Navás, 1918 : 15. Type species (by original designation), *Hydropsyche lepida* Pictet, 1834.

Second segment of maxillary palpus usually cylindrical, but sometimes triangularly dilated, third segment as long as, or longer than, the fourth. Spurs 2.4.4, sometimes 0.4.4 in male. Median leg of female dilated. In fore wing,  $Cu_2$  and 1A end separately

in the wing margin and the cross-veins *m-cu* and *cu* are situated close together. In the hind wing, the median cell is open, the veins *M* and *Cu* are widely separated and the cross-vein between them is obvious. Fork  $R_2$  sometimes present but usually absent.

As a result of the amalgamation of these two genera, the species *Hydropsychodes varius* Kimmins (1955 : 391), from Sarawak, becomes a homonym of *Cheumatopsyche varia* (Rambur, 1842) and is renamed *Cheumatopsyche dulitensis* **nom. n.**

*Cheumatopsyche stigma* Kimmins (1955 : 390), also from Sarawak, is a somewhat aberrant member of the genus as regards venation. In the fore wing,  $Cu_1$  and  $1A$  fuse shortly before the wing margin, and in the hind wing the discoidal cell is open. Should more species be found having similar venation, it may be necessary to separate them generically, but for the present, *Ch. stigma* Kimmins is retained as an aberrant species of *Cheumatopsyche*.

### *Cheumatopsyche sexfasciata* (Ulmer) **comb. n.**

(Text-figs. 30-34)

*Hydropsyche sexfasciata* Ulmer, 1904 : 421, figs. 10-12.

*Hydropsychodes sexfasciata* (Ulmer) Ulmer, 1905 : 35.

Koka Dam, 29.iii.1961 ; Dawa River, 12 km. N. of Hudat, 12.iv.1961 ; Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961 (*A. Tjønneland*) ; Ghibe River, 260 km. from Addis Ababa, 6.v.1961 (*S. Chojnacky*).

There are long series from most of the above localities of what I believe to be Ulmer's *C. sexfasciata*. The types were collected in Cameroons and there are examples from Sierra Leone in the British Museum (Nat. Hist.), determined by M. E. Mosely. As Ulmer's figures were made from dried material, new figures of the wings, of the male and female genitalia and new descriptions of the latter are given, based upon the Ethiopian material.

♂ **GENITALIA.** Ninth segment with its apical dorsal margin produced in two rounded, setigerous lobes, with a slightly convex excision between them. Side-pieces bluntly triangular. Tenth segment fused to ninth, forming a short hood. In dorsal view, the lateral margins taper slightly and the apical angles are triangularly produced, their apices clavate and finely dentate. Apical margin between them slightly produced and truncate. On each side of the dorsal surface of the tenth segment is a small, rounded, setigerous callus. Aedeagus broad at base, tapering towards the apex, only slightly curved, apex carrying a pair of rounded, incurved lateral lobes, concave internally and concealing a pair of opposing teeth. Clasper slender, slightly sinuous, basal segment with a wide base in ventral view and with a slightly clavate apex. Terminal segment much thinner than basal, upcurved in side view, sinuous in ventral view.

♀ **GENITALIA.** Reticulated areas present on fourth abdominal pleurites. Apical margin of eighth tergite in side view produced in a shallow, rounded lobe on each side. Clasper receptacle of ninth segment with a very narrow opening, inner part of receptacle curved apically. Clasper groove short and straight.

The sinuous, slender apical segment of the male clasper and the presence of reticulated areas on the fourth pleurite of the female suggest an affinity with *C. afra* (Mosely).



*Cheumatopsyche bimaculata* (Ulmer) comb. n.

(Text-fig. 35)

*Hydropsychodes bimaculata* Ulmer, 1930 : 491, fig. 15.

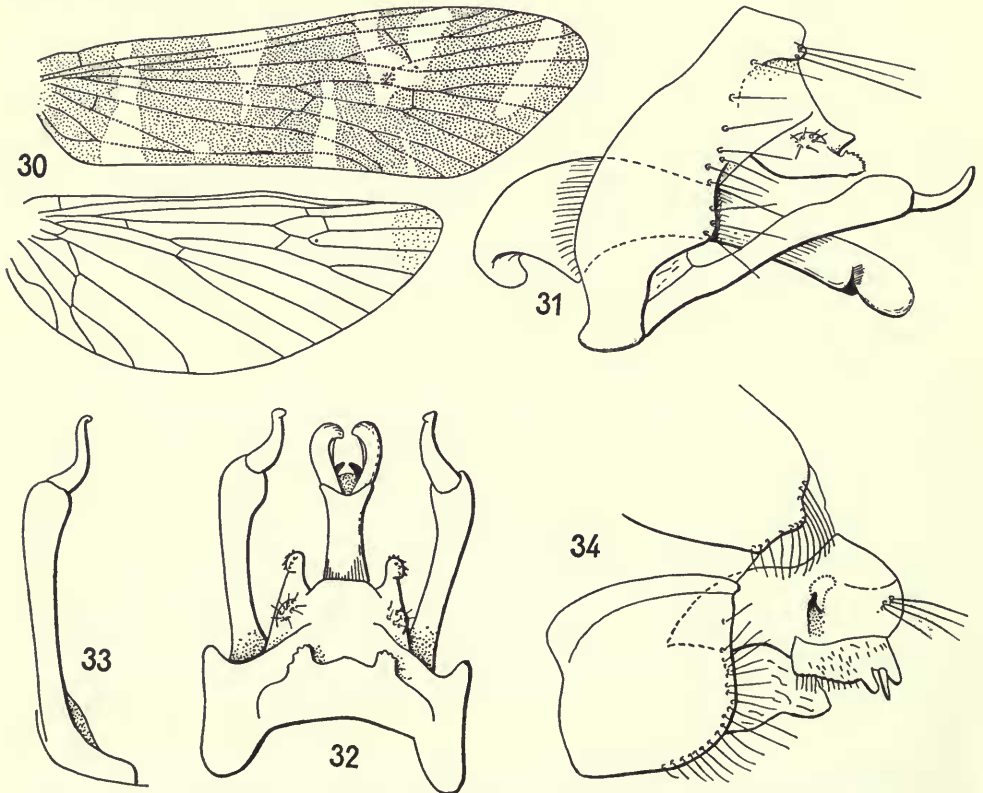
No further material of this species has yet come to hand and therefore a description and figure are given of the genitalia of the female HOLOTYPE, which has now been made into microscope preparations.

♀ GENITALIA. No reticulated areas on the fourth pleurites. Eighth sternite with the pleurosternum projecting beyond the apical margin of the sternite, giving the latter the appearance of being widely concave in side view. In ventral view, the apical margin is more or less straight, with a V-shaped excision between the two halves. Ninth segment short and with its dorsal margin strongly convex in side view. Clasper receptacle moderately broad at its opening, tapering to its apex, which is bent mesally. Clasper groove long, with a raised and sinuous basal margin. Fused ninth and tenth sternites membranous.

*Cheumatopsyche albomaculata* (Ulmer) comb. n.

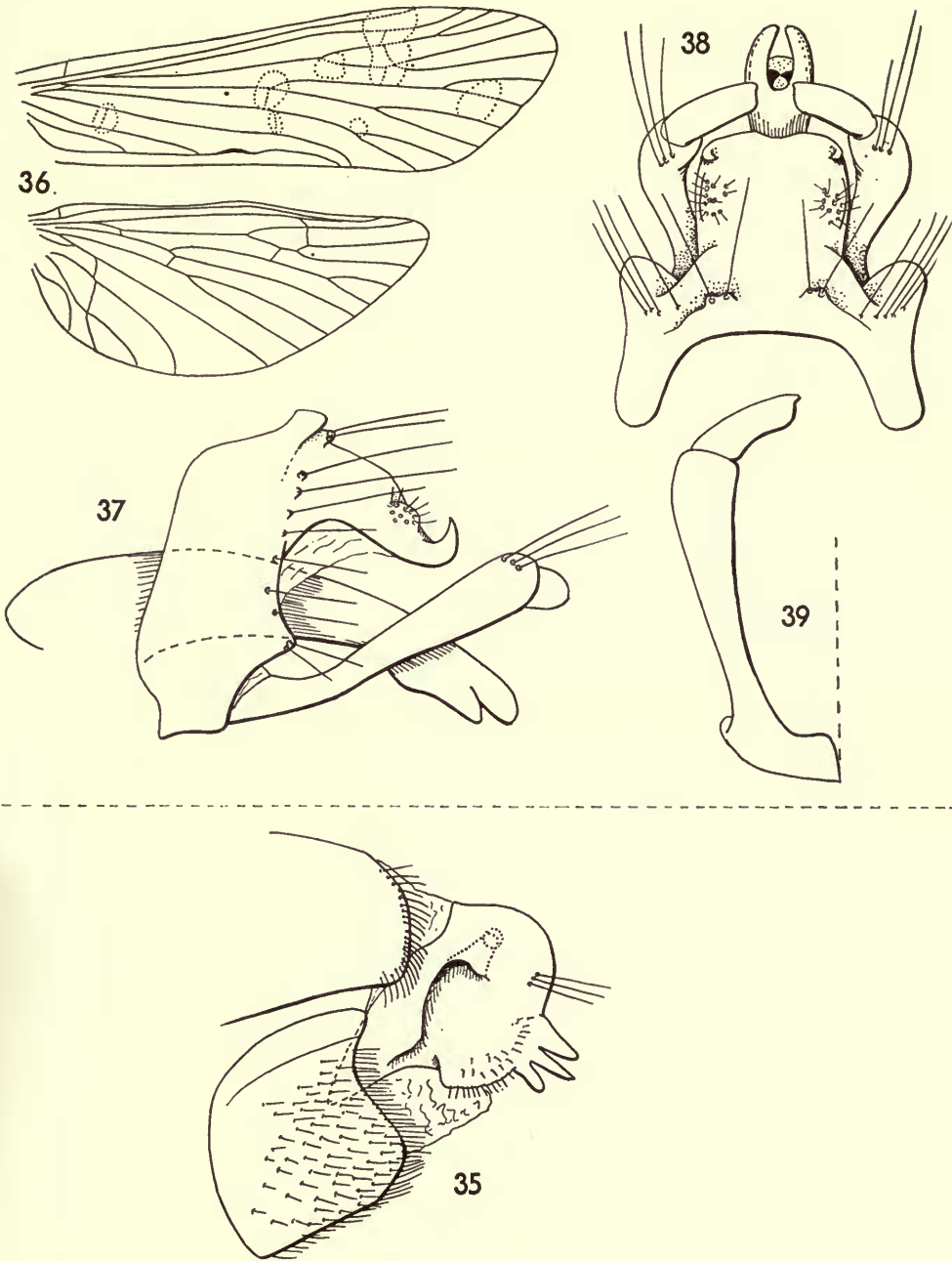
(Text-figs. 35-39)

*Hydropsychodes albomaculata* Ulmer, 1905 : 34, fig. 22 ; Mosely, 1939 : 27, fig. 80 ; Jacquemart, 1957 : 102, figs. 84-88.



FIGS. 30-34. *Cheumatopsyche sexfasciata* (Ulmer). 30, ♂ wings ; 31, ♂ genitalia, lateral ; 32, ♂ genitalia, dorsal ; 33, ♂ left clasper, ventral ; 34, ♀ genitalia, lateral.





FIGS. 35-39. *Cheumatopsyche bimaculata* (Ulmer), Type ♀. 35, genitalia, lateral. *Cheumatopsyche albomaculata* (Ulmer), ♂, 36, wings; 37, genitalia, lateral; 38, genitalia, dorsal; 39, left clasper ventral.

As mentioned in the generic introduction, the presence of an open median cell in the fore wing may not be a constant character. Ulmer's description of the general appearance and Mosely's figure of the fore wing are adequate, but as Jacquemart's figures of the male genitalia are a little confusing, I am giving new figures and descriptions of the male genitalia of the paratype presented to Mr. M. E. Mosely by Dr. Ulmer.

♂ GENITALIA. Ninth segment narrow above, fused to the tenth, its apical margin produced in a pair of small, setigerous lobes. Side-pieces moderately prominent and triangular. Tenth segment forming a quadrate plate or hood, lateral and apical margins slightly convex, the latter with a shallow median excision. The apical angles are produced upwards in small, recurved claws. There are two small, slightly raised, setigerous calli, one on each side rather beyond the middle. Aedeagus slightly curved, slender, lower margin gently convex beyond the middle. The apex bears two lateral lobes and beneath them a rounded ventral lobe. Basal segment of clasper in ventral view with a broad base, narrowing abruptly and then gradually dilating to a clavate apex. Terminal segment short, stout, in ventral view with outer apical angle slightly produced.

Distribution : CONGO.

The genitalia of *C. lesnei* (Mosely), from Mozambique and East Africa, strongly resemble *C. albomaculata* (Ulmer), but in *lesnei* the apical margin of the tenth segment is more produced at its centre and the apices of the claspers are more acute. In side view, the apical hooks of the tenth segment are smaller and more recurved in *lesnei*. The biggest difference is in the fore wings, which are brownish with white patches in *albomaculata*, and yellowish brown with small golden irrorations in *lesnei*.

### *Cheumatopsyche simplex* sp. n.

(Text-figs. 40-44)

(In alcohol.) Head and thorax dark brown, with paler warts, pubescence fuscous. Antennae fuscous, darker at bases, and with traces of a dark brown, oblique line on segments basally (as in *Hydropsyche*). Palpi fuscous, second segment of maxillary palpus cylindrical. Legs pale fuscous. Abdominal tergites and sternites pale fuscous. Wings pale brownish hyaline, fore wing clothed with brownish pubescence, sometimes with faint golden mottling, which may be more obvious in living or dried specimens. Venation of fore wing recalling that of *C. albomaculata* (Ulmer), in that the median cell is frequently open. The footstalk of fork  $R_2$  is short and the discoidal cell overlaps the base of fork  $R_4$ . The thyridial cell extends beyond the fork of the media and veins  $Cu_2$  and  $1A$  meet at a point, or are sometimes joined by a short cross-vein.

♂ GENITALIA. Ninth segment short, apical margin scarcely produced. Tenth segment short, fused to the ninth; it forms a convex hood, with the apical lateral angles only very slightly produced, stumpy and truncate. The apical margin is widely and shallowly excised between the lateral angles. On either side of the tenth segment, towards the base, is a small, setigerous callus, and there is also a raised area of short setae on the dorsal surface. Aedeagus rather stout basally, tapering to about midway and then becoming cylindrical, with a slight ventral keel before the apex. The latter bears the usual pair of lateral lobes. Basal segment of clasper moderately slender, clavate and slightly more pigmented at its apex. Terminal segment very slender.

♀ GENITALIA. No reticulated areas on pleurites of fourth segment. Eighth sternite with the apical lateral margin rounded, sternite ventrally divided to its base by a narrow, median excision. Ninth tergite elongate, dorsal margin rounded. Ventral lateral margin not produced

in lateral lobes. Clasper receptacle narrow, curved caudad, clasper groove wide. Combined ninth and tenth sternites forming a lightly sclerotized plate, vase-shaped in ventral view.

Length of fore wing, ♂ 7 mm., ♀, 7.5 mm.

Holotype ♂, Dire Dawa distr., 5,000–8,000 ft. (*B. G. Hill*), BMNH, mounted as microscope preparations.

Allotype ♀, Dire Dawa distr., 5,000–8,000 ft. (*B. G. Hill*), BMNH.

Paratypes, Dire Dawa distr., 5,000–8,000 ft., 24 ♂, 1 ♀ (*B. G. Hill*), BMNH.

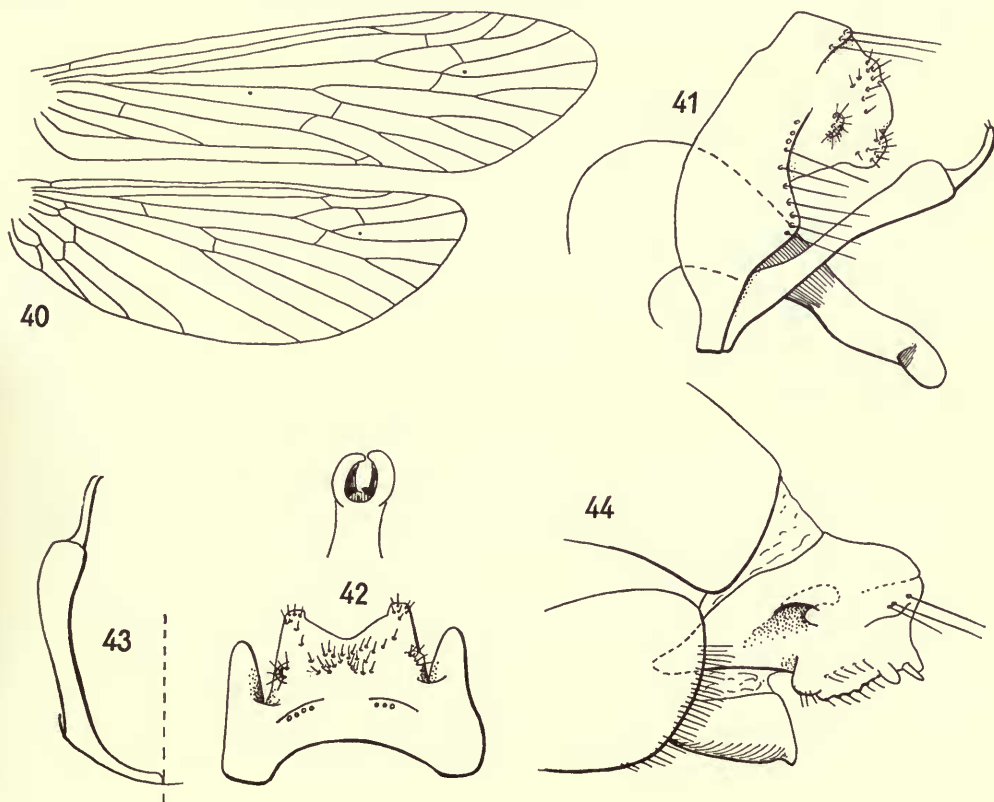
This species shares with *C. albomaculata* (Ulmer) the character of the median cell in the fore wing being frequently open in one or both wings. It may however be readily distinguished from that species by its immaculate wings, the cylindrical second segment of the maxillary palpus (triangular in *albomaculata*) and by the male genitalia.

### *Cheumatopsyche plutonis* (Banks)

*Symphitopsyche plutonis* Banks, 1913 : 239, figs. 2, 4, 5.

*Hydropsychodes plutonis* (Banks) Ulmer, 1930 : 488, figs. 11–13.

*Cheumatopsyche plutonis* (Banks) Kimmins, 1960 : 257, 263.



FIGS. 40–44. *Cheumatopsyche simplex* sp. n. 40, ♂ wings; 41, ♂ genitalia, lateral; 42, ♂ genitalia, dorsal; 43, ♂ left clasper, ventral; 44, ♀ genitalia, lateral.

The Wachacha Ravine examples listed by Ulmer appear to be *C. afra* (Mosely). I have not seen any typical *C. plutonis*.

***Cheumatopsyche obscurata* (Ulmer)**

(Text-fig. 45)

*Hydropsychodes obscurata* Ulmer, 1930 : 485, figs. 8-10.

*Cheumatopsyche obscurata* (Ulmer) Kimmins, 1960 : 263, figs. 20-23.

Dire Dawa district, 5,000-8,000 ft., 1961, 9 ♂, 2 ♀ (*B. G. Hill*).

Some examples in the series collected by Mr. Hill show a tendency towards an open median cell in the fore wing. As Ulmer's description was based upon males only, the opportunity is taken of describing and figuring the genitalia of the presumed female of *C. obscurata*.

♀ GENITALIA. No reticulated areas on the pleurites of the fourth segment. Eighth sternite with apical lateral margin somewhat sinuously rounded, sternite divided to its base in ventral view, opening to a V-shaped excision beyond half way. Ninth tergite moderately elongate, dorsal margin rounded. Ventral lateral margin produced in a lateral lobe. Clasper receptacle large, curved caudad, reaching almost to the median line. Mouth of the receptacle with a thin, rounded lobe on distal side. Clasper groove broad and deep. Combined ninth and tenth sternites membranous.

***Cheumatopsyche falcifera* (Ulmer)**

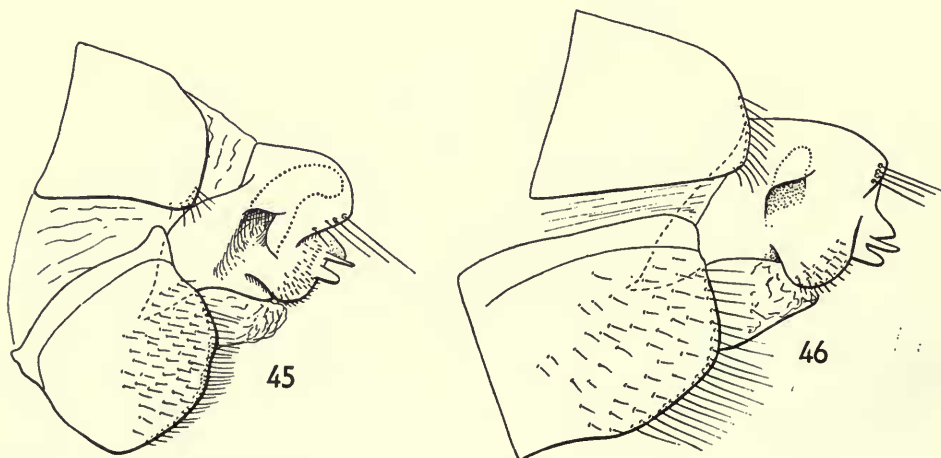
(Text-fig. 46)

*Hydropsychodes falcifera* Ulmer, 1930 : 482, figs. 4-6 (nec *H. falcifera* var. fig. 7).

*Hydropsychodes zuluensis* Barnard, 1934 : 360, figs. 37, h-j.

*Cheumatopsyche falcifera* (Ulmer) Kimmins, 1957 : 6, fig. 6 ; id., 1960 : 263, figs. 24-27.

Ghibe River, 215 km. from Addis Ababa, 13-14.iv.1961, numerous ♂♂ (*A. Tjønneland*).



FIGS. 45-46. *Cheumatopsyche* spp. ♀ genitalia, lateral. 45, *Ch. obscurata* (Ulmer) ; 46, *Ch. falcifera* (Ulmer), paratype.

In comparison with the type of *falcifera*, these males show some slight difference in genitalia. The apical processes of the tenth segment have the ventral margin straight, not sinuous, in side view. The terminal segment of the clasper is slightly more slender in ventral view. These differences are not considered to be of specific importance. The degree of divergence of the apical lateral lobes of the aedeagus is not necessarily of specific value, since they possess a certain degree of movement.

There are no females which can be associated with certainty with the Ghibe River males. The collection from this locality also included numerous males of a smaller and darker species (*C. nubila* sp. n.), and the females taken at the same time are referred to that species on the grounds of size and general appearance. One can only assume that females of *falcifera* were not on the wing on this particular night.

As the female of *C. falcifera* has not been figured or described, this omission is remedied with the aid of a paratype from the Muger Valley.

♀ GENITALIA. No reticulated area on the pleurites of the fourth abdominal segment. Pleurosternum of eighth segment scarcely projecting beyond apical margin of sternite, which is gently rounded in ventral view. Ninth tergite short and deep, clasper receptacle short and broad, clasper groove inconspicuous. Lower angle of tenth tergite in side view large and rounded. Ninth and tenth tergites lightly sclerotized.

### *Cheumatopsyche nubila* sp. n.

(Text-figs. 47-50)

*Cheumatopsyche* ? *thomasseti* (Ulmer) Kimmins, 1960 : 265, fig. 70 (♀, Jameson's Drift).

(In alcohol.) Head dark brown, with scanty golden pubescence. Antennae each with the two basal segments brownish, following segments luteous, faintly annulated, the segments becoming progressively fuscous towards the apices of antennae. Palpi fuscous, second segment of maxillary cylindrical. Thorax dark brown above, paler on sides. Legs luteous, with fuscous pubescence, the median femora pale fuscous. Fore wing membrane pale fuscous, with paler irrorations, veins fuscous. Pubescence fuscous, with golden spots, probably dense in life but largely denuded in alcohol. Hind wing pale fuscous.

♂ GENITALIA. Similar in pattern to *C. thomasseti*. Ninth segment with dorsal projections stronger and side-pieces more triangular. Tenth segment in side view narrower at apex and the lateral apical processes shorter and stouter, the excision between the clavate part and apical margin of tergite narrow. In dorsal view, the apical processes are ovate rather than transverse. Aedeagus with dorsal margin slightly excavate before apex in side view. Terminal segment of clasper in ventral view narrower.

♀ GENITALIA. Fourth pleurite with a quadrangular reticulated area on each side. Lateral apical margin of eighth sternite shallowly excised below the pleurosternum, then smoothly convex in side view. In ventral view, sternite excised to its base, excision narrow and parallel-sided. Clasper receptacle of ninth segment large and complex, its basal side partly covered by a narrow flange. Apical margin of opening extending along distal margin. Throat of receptacle rugose, apex bent back upon itself in a ventral direction. Ventral margin of ninth tergite sinuous at base. Tenth tergite short and deep.

Length of fore wing, ♂, ♀, 6.25 mm.

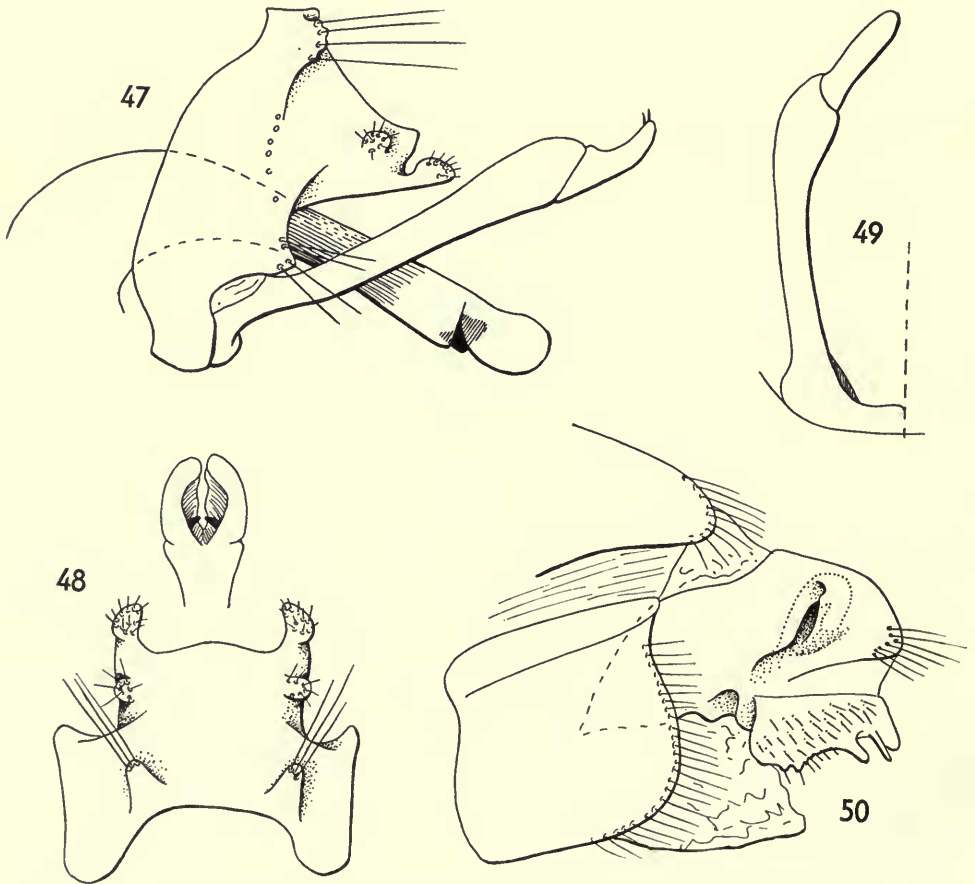
Holotype ♂, Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961 (*A. Tjønneland*), BMNH, mounted as microscope preparations.



Allotype ♀, Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961 (*A. Tjønneland*), BMNH, mounted as microscope preparations.

Paratypes, Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961, numerous ♂, ♀ (*A. Tjønneland*), BMNH, UCAA.

This species appears to be related to *C. thomasseti* (Ulmer), and the differences in the male genitalia are set out above. In the females, both species have the reticulated areas on the fourth pleurite, but *nubila* may be distinguished by its much more complex clasper receptacle. The female genitalia of this species were first figured by Kimmins (1960) under the name *C. ?thomasseti* (Ulmer), from an example taken in Natal, at Jameson's Drift, 29.iv.1954. The males taken at the same time were then identified as *thomasseti*, but subsequent examination has shown them to be *C. nubila*. The Ethiopian examples were taken in a light trap in company with many males of *C. falcifera* (Ulmer). In general appearance, *C. nubila* is both smaller and darker brown than *C. falcifera*.



FIGS. 47-50. *Cheumatopsyche nubila* sp. n. 47, ♂ genitalia, lateral; 48, ♂ genitalia, dorsal; 49, ♂ left clasper, ventral; 50, ♀ genitalia, lateral.

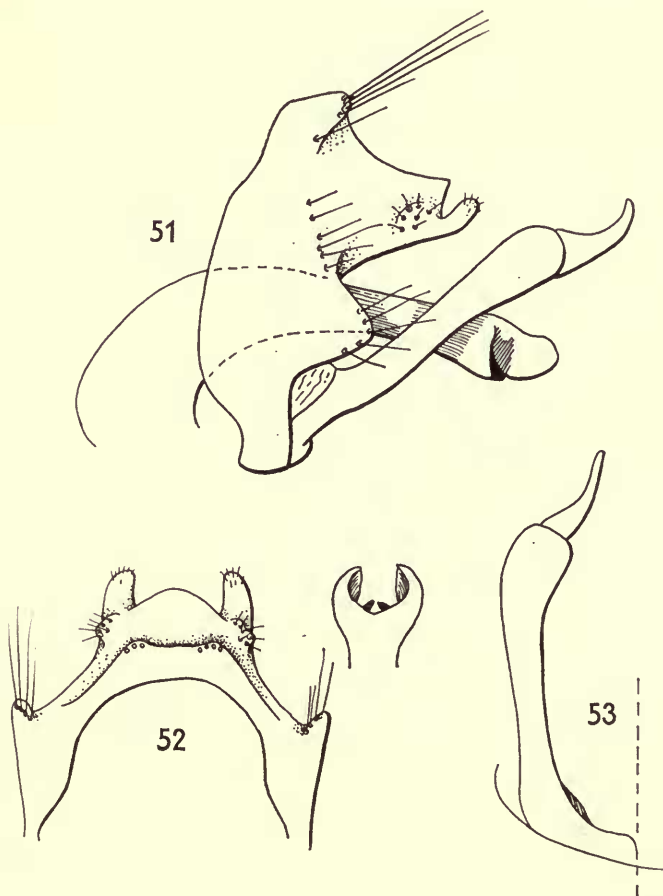
*Cheumatopsyche afra* (Mosely)

(Text-figs. 51-53)

*Hydropsychodes afra* Mosely, 1935 : 229, figs. 17-20.*Hydropsychodes falcifera* Ulmer, var. 1930 : 485, fig. 7 (Muger Valley ♂), **syn. n.***Hydropsychodes plutonis* (Banks) Ulmer (partim), 1930 : 491, fig. 14 (Wachacha Ravine examples).*Hydropsychodes lateralis* Barnard (partim), 1934 : 362-364, figs. 37 a-f, 38.*Cheumatopsyche afra* (Mosely) Kimmins, 1960 : 266, figs. 36-67, 72-76.

Koka Dam, 16-17.i, 9.iii.1961 ; Dawa River, 12 km. N. of Hudat, 12.iv.1961 ; stream near Gofa village, 14.iv.1961 (*A. Tjonneland*) ; Ghibe River, 260 km. from Addis Ababa, 6.v.1961 (*S. Chojnacky*).

Numerous examples from most of the above localities. Examination of the specimens figured by Ulmer (1930) as a variety of *C. falcifera* and as a variety of



FIGS. 51-53. *Cheumatopsyche afra* (Mosely). ♂ genitalia of *Ch. falcifera* (Ulmer), var. 51, lateral ; 52, dorsal ; 53, left clasper, ventral.

*C. plutonis* (Banks) reveals that they are forms of the widespread and variable species *C. afra* (Mosely).

### *Cheumatopsyche* sp.

Gamo Prov., Gughé highlands, Bonghé, c. 9,000 ft., 29.xii.1948, from foliage of willows and flood-refuse by stream in flat valley, 2 ♀ (*Hugh Scott*); Sokorro stream, Wodorro village, 22-23.iv.1960, 1 ♀ (*A. Tjønneland*).

### *Hydropsyche propinqua* Ulmer

*Hydropsyche propinqua* Ulmer, 1907: 21, figs. 32-33; Mosely, 1939: 22-23, figs. 64-66.

Ghibe River, 260 km. from Addis Ababa, 6.v.1961 (*S. Chojnacky*).

Previous distribution: CAMEROONS.

### *Hydropsyche abyssinica* sp. n.

(Text-figs. 54-59)

(In alcohol.) Head dark brown, with piceous hairs. Antennae and palpi pale fuscous. Thorax dark chestnut-brown above, paler on sides. Legs luteous, with fuscous pubescence. Fore wing with fuscous pubescence, rather denuded but with traces of small spots of golden pubescence. Hind wing hyaline, with fuscous pubescence. Venation (fig. 54) differing in some details from the typical *Hydropsyche* pattern. In the fore wing,  $Cu_2$  and 1A end separately in the wing margin. In the hind wing, fork  $R_2$  is absent, the median cell is open and  $M$  does not run very close to  $Cu_1$ . Abdomen luteous, shaded with purplish.

♂ GENITALIA. Side-pieces of ninth segment broad and rounded. Tenth segment fused to ninth, in side view nearly as long as ninth, slightly tapering to a bluntly rounded apex, which bears a small, triangular lobe on each side. On the sides are several groups of setae. From above, the tenth segment also tapers gently towards the apex, which is blunt and with a narrow, U-shaped, median excision. The triangular lobes appear as small processes at the lateral angles. Aedeagus short, bent downwards to a somewhat clavate apex. Beneath the apex is a slender process, extending slightly beyond the apex and terminating in a pair of rather transparent, divergent fingers. On each side of the aedeagus, shortly before the apex arises a short, membranous process, directed laterally and fringed with stout setae. Clasper with a long and rather slender basal segment, slightly clavate apically and a very short terminal segment, tapering to an acute apex.

♀ GENITALIA. Eighth sternite in ventral view with a wide, V-shaped excision of the apical margin, which extends nearly half way to the base of the sternite. In side view, apical margin is irregularly rounded. Ninth tergite with its ventro-caudal margin produced in a rounded, laminate lobe, fringed with setae. Clasper groove broad and curved, the clasper receptacle reduced to a minute pit. Combined ninth and tenth sternites lightly sclerotized.

Length of fore wing, ♂, 8 mm., ♀, 11 mm.

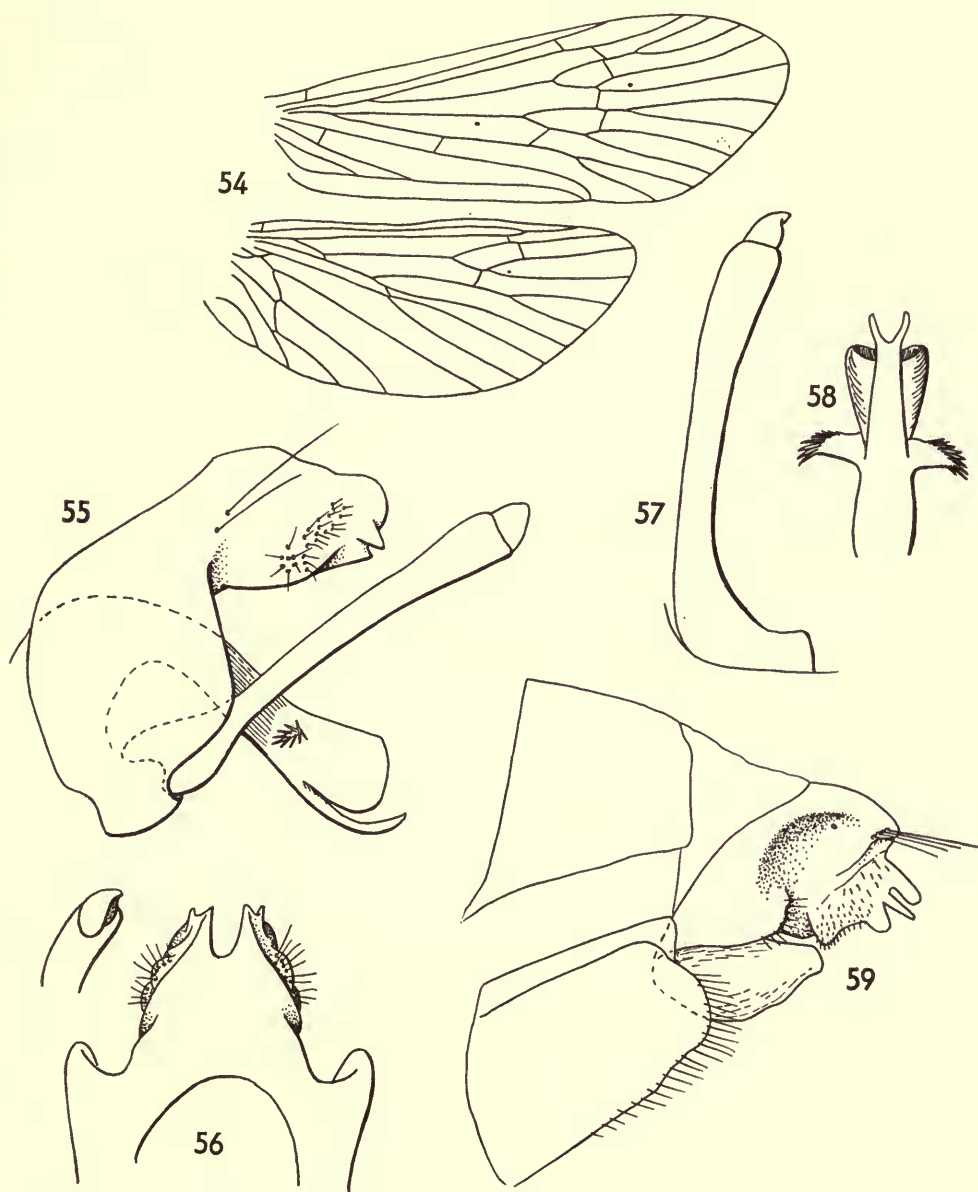
Holotype ♂, Koka Dam, 29.iii.1962 (*A. Tjønneland*), BMNH, mounted as microscope preparations.

Allotype ♀, Koka Dam, 29.iii.1961 (*A. Tjønneland*), BMNH, in 2% formaldehyde solution, hind wing and abdomen mounted as microscope preparations.

Paratypes, Wondo Abella, 24.iv.1960, 1 ♂; Koka Dam, 29.iii.1961, 11 ♂,

numerous ♀; stream near Gofa village, 15 km. from Adolla, 14.iv.1961, 1 ♀ (*A. Tjønneland*), BMNH, UCAA.

This species has been retained in the genus *Hydropsyche*, in spite of the differences in the wing venation, on the obvious similarity of the male genitalia with those of



FIGS. 54-59. *Hydropsyche abyssinica* sp. n. 54, ♂ wings; 55, ♂ genitalia, lateral; 56, ♂ ninth and tenth tergites, apex of clasper, dorsal; 57, ♂ left clasper, ventral; 58, apex of aedeagus, ventral; 59, ♀ genitalia, lateral.

the *propinqua*-group of *Hydropsyche*. The open median cell in the hind wing is the most important difference; this generic character has already been found to be unstable in the New Zealand species, where the median cell is also usually open. One could, of course, continue the process of dismembering the genus *Hydropsyche*, and make further new genera, but such an operation would be better undertaken during a major revision of the Hydropsychine genera than in a paper on a local fauna.

*H. abyssinica* sp. n. comes nearest to *H. namwa* Mosely (1939 : 25) and may be distinguished by the much shorter terminal segment of the clasper and by differences in the aedeagus and tenth tergite, and of course by the absence of fork  $R_2$  and the median cell in the hind wing.

### Subfamily DIPLECTRONINAE

#### *Diplectronella?* *afra* Mosely

Mosely, 1931 : 202-205, figs. 10-13.

Gamo Prov., Gughé Highlands, Bonghé, c. 9,000 ft., 29.xii.1948, from foliage of willows and flood refuse by stream in flat valley, 1 ♂ (*H. Scott*).

This specimen is referred here with some doubt. It is larger than typical *D. afra* and there are slight differences in male genitalia. Should more material confirm that these differences are constant, it will be necessary to erect a new specific name for it.

#### *Diplectronella* sp.

Wondo Abella, cold stream, 24.iv.1960, 1 larva (*A. Tjønneland*).

### Family LEPTOCERIDAE

#### Subfamily LEPTOCERINAE

#### *Pseudoleptocerus schoutedeni* Navás

Mosely, 1933 : 541-544, figs. 6-10.

Koka Dam, 29.iii.1961, 4 ♂, 5 ♀; Lake Margherita, 8-9.iv.1961, 2 ♀; stream near Gofa village, 15 km. from Adolla, 14.vi.1961, 3 ♂, 4 ♀; Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961, 4 ♂, 4 ♀ (*A. Tjønneland*).

Previous distribution : CONGO, RUANDA, UGANDA and SUDAN.

#### *Pseudoleptocerus corbeti* Kimmins

Kimmins, 1957 : 17-19, figs. 10-11.

Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961, numerous ex. (*A. Tjønneland*).

A few male and females of *Ps. schoutedeni* Navás were taken with the Ghibe River examples of *corbeti*. The females of *schoutedeni* may be distinguished from *corbeti* by the dense black pubescence of the maxillary palpi. In *corbeti* the palpi are sparsely clothed with grey and black pubescence.

Previous distribution : UGANDA.



*Triaenodes triaenodiformis* (Ulmer) comb. n.

(Text-figs. 60-66)

*Adicella triaenodiformis* Ulmer, 1930 : 493-495, figs. 16-17 (♀).

The genitalia of a female example taken by Tjønneland are identical with those of *Adicella triaenodiformis* Ulmer and the wing venation also agrees in possessing a complete, though weak, stem to *M* in the fore wing. Ulmer has pointed out that the venation is very like that of *Triaenodes* apart from the presence of a complete stem to *M* in the fore wing, a character which has since been found to be somewhat unreliable. In view of the greater resemblance of the female genitalia to *Triaenodes* than to *Adicella*, I therefore transfer this species to *Triaenodes* and describe and figure the male genitalia. The specimens collected by Tjønneland are somewhat rubbed and show no traces of wing pattern.

♂ (in alcohol). Antennae pale tawny, finely annulated with piceous at the joints, basal segment long and with a long tuft of silky hairs on the dorsal surface at the base.

♂ GENITALIA. Ninth segment narrowed above, the centre of the apical dorsal margin produced and slightly bilobed. Tenth segment long, its apical two-thirds forming two very slender spines, dilated caudad. Each spine, before its apex, is looped backwards twice to form two tight, spring-like coils, then continuing caudad and slightly upward to an acute apex, giving the two spines the appearance of a pair of horns or a two-pronged fork. Cerci long, not very slender, apices curving slightly inwards and downwards. Aedeagus rather shorter than the tenth segment, bent downwards and widening before midway. From above, it forms an open trough, with a bifid, membranous structure arising from its centre. Clasper from beneath triangular, inner margin divergent and straight, outer sinuous, tapering to a narrow apex. The inner surface is armed with a number of stout spines. The outer margin is produced about midway in a short branch. There are two basal branches with a common origin on the dorsal surface. Both are slender at base, the inner one bent downwards before midway and becoming spatulate, situated alongside the aedeagus. The outer one is directed caudad, becoming slightly clavate apically. In the ventral illustration, the vestiture has been omitted on one side to show the branches more clearly.

♀ GENITALIA. Apical margin of eighth sternite straight and densely fringed with setae. Ninth tergite short, fused to the short, tubular tenth segment, which has an excised ventral margin. Cerci closely appressed to the tenth segment, roughly pentagonal from the side, triangular from above. Lateral gonapophyses short, rounded, convex externally, apices incurved. Subgenital plate broad, its centre strongly elevated in a narrow, longitudinal ridge, which terminates in a small, projecting lobe. Apical margin of subgenital plate sinuous, lateral margins rounded. Internal structure somewhat obscure, trilobed basally.

Length of fore wing, ♂, 7.3 mm., ♀, 6.7 mm.

Holotype ♀ in the BMNH; the abdomen has been cleared and preserved in glycerine.

Allotype ♂: Ghibe River, 260 km. from Addis Ababa, 6.v.1961 (*S. Chojnacky*), BMNH.

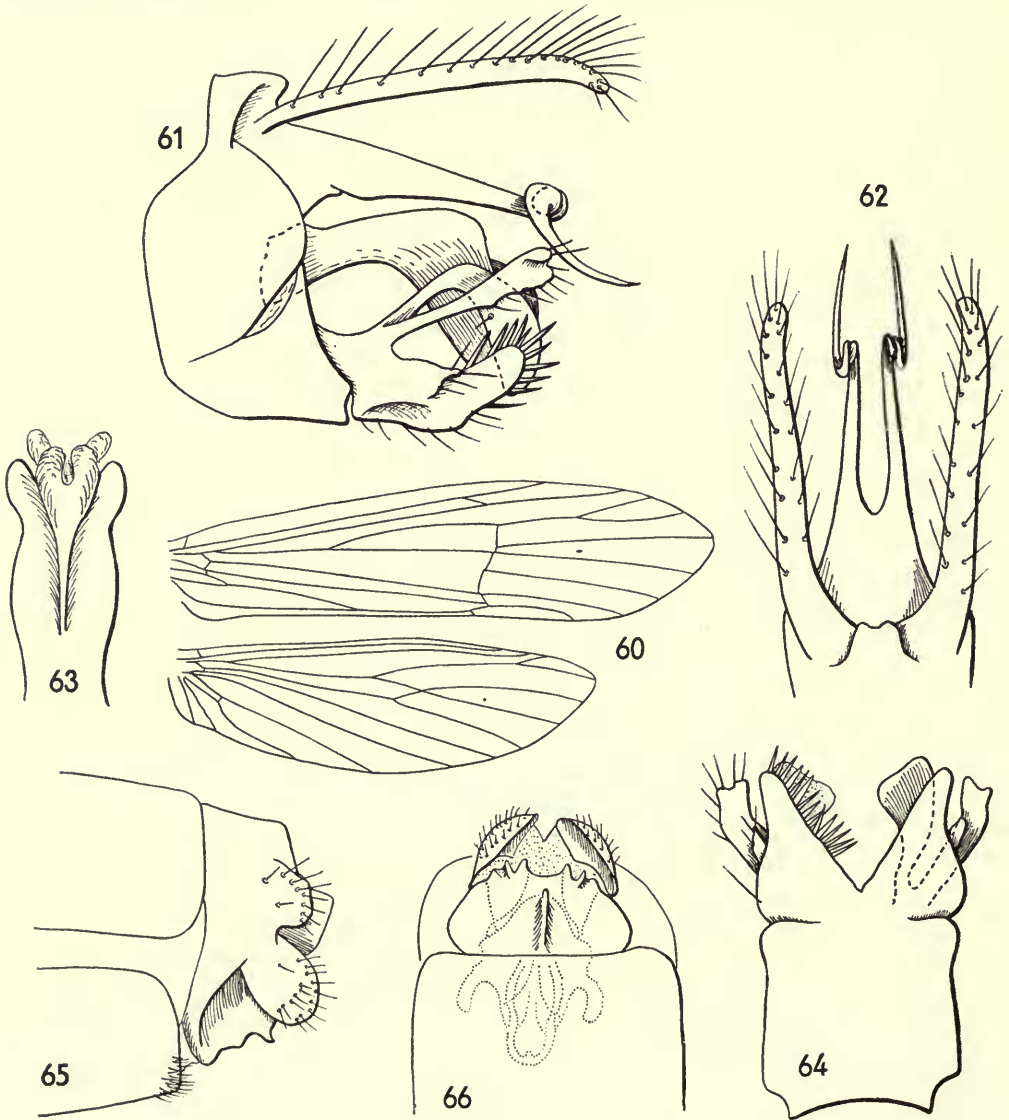
Additional material: Stream near Gofa village, 15 km. from Adolla, 1 ♂; Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961, 6 ♂, 1 ♀, (*A. Tjønneland*), BMNH, UCAA; N. RHODESIA: R. Zambezi, Katambora, iv. 1962, 1 ♂ (*E. Pinhey*)

In male genitalia this species differs from any African *Triaenodes* known to me in its tenth tergite with the double-coiled spines. *T. serrata* Ulmer and *T. falculata* Kimmins both have a long, curved spine arising from the tenth tergite, but the

spine is usually single and more or less flexibly attached to the undivided tergite. *T. triaenodiformis* has possibly evolved from a species with a deeply divided tergite, such as *T. legona*, *T. wambana* or *T. darfurica*.

*Triaenodes* sp. near *elegantula* Ulmer

Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961, 1 ♂ (*A. Tjønneland*).



FIGS. 60-66. *Triaenodes triaenodiformis* (Ulmer). 60, ♂ wings; 61, ♂ genitalia, lateral; 62, ♂ ninth and tenth tergites, dorsal; 63, ♂ aedeagus, dorsal; 64, ♂ ninth sternite and claspers, ventral; 65, ♀ genitalia of type, lateral; 66, the same, ventral.

This specimen is clearly related to *T. elegantula* Ulmer, but differs in certain details in male genitalia. It is probably a new species, but it is being left undetermined, pending the discovery of more material.

*Triaenodes* sp.

Gamo Prov., Gughé Highlands, Bonghé, c. 9,000 ft., 29.xii.1948, 1 ♀ (*H. Scott*).

*Parasetodes sudanensis* Ulmer

Lake Margherita, 8-9.iv.1961; Dawa River, 12 km. N. of Hudat, 12.iv.1961; stream near Gofa village, 15 km. from Adolla, 14.iv.1961; Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961 (*A. Tjønneland*).

Fair series of this species were obtained from most of the above localities.

Previous distribution: SUDAN, UGANDA, KATANGA and MOZAMBIQUE.

*Athripsodes fissa* (Ulmer)

*Athripsodes jinjana* Kimmins, 1957: 24-26 (partim, ♀ allotype and majority of females, fig. 17 D).

Lake Awasa, 6, 27.xi.1960; Lake Langano, 7.iv.1961; Black River, near Lake Awasa, 15.iv.1961; Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961 (*A. Tjønneland*).

A species widely distributed in Africa.

*Athripsodes jinjana* Kimmins

(Text-fig. 67)

Kimmins, 1957: 24-26, fig. 17 (partim, nec fig. D).

Koka Dam, 29.iii.1961, 1 ♂, 1 ♀; Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961, ♂♂, ♀♀ (*A. Tjønneland*); Ghibe River, 260 km. from Addis Ababa, 6.v.1961, 1 ♂ (*S. Chojnacky*).

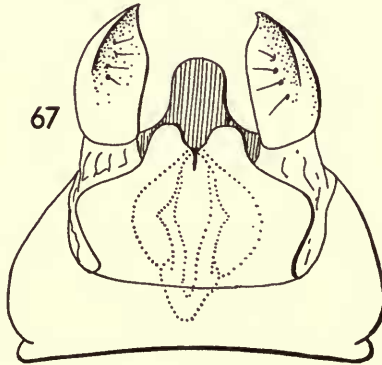


FIG. 67. *Athripsodes jinjana* Kimmins. ♀ genitalia, ventral.

Since the description of this species was published, I have had doubts whether the female figured as that of *A. jinjana* was correctly associated. When dealing with the Ethiopian material, the females of the type-series of *A. jinjana* were re-examined and I now believe that females of two species were included. The allotype female, most of the paratype females from Jinja and the two females from Bukakata should be transferred to *A. fissa* (Ulmer). Three females from Jinja and the females from Kampala and Entebbe are different and are probably the true females of *A. jinjana* Kimmins. I am therefore giving a new figure of the female genitalia of the latter species. The chief differences are in the shape of the apical margin of the subgenital plate, which in *jinjana* is sinuous and produced at its centre in two spatulate lobes with a V-shaped excision between them. In *fissa* the apical margin forms an obtuse angle, the sides of the median excision being either parallel or concave, so that the angles may appear to approach each other. The median, dorsal process of the ninth-tenth segment is spatulate in ventral view in *jinjana*, whereas in *fissa* it is bluntly triangular, variable in size, sometimes much reduced.

It is interesting to note that, in the Ghibe River examples, the venation of the fore wing of the female is variable, the additional apical vein characteristic of *Athripsodes* females sometimes being absent, i.e. of the *Homilia* type, although there are no appreciable differences in the genitalia of the two forms. This is further evidence that the separation of *Athripsodes* and *Homilia* is not really justifiable.

### *Athripsodes niveosquamosa* sp. n.

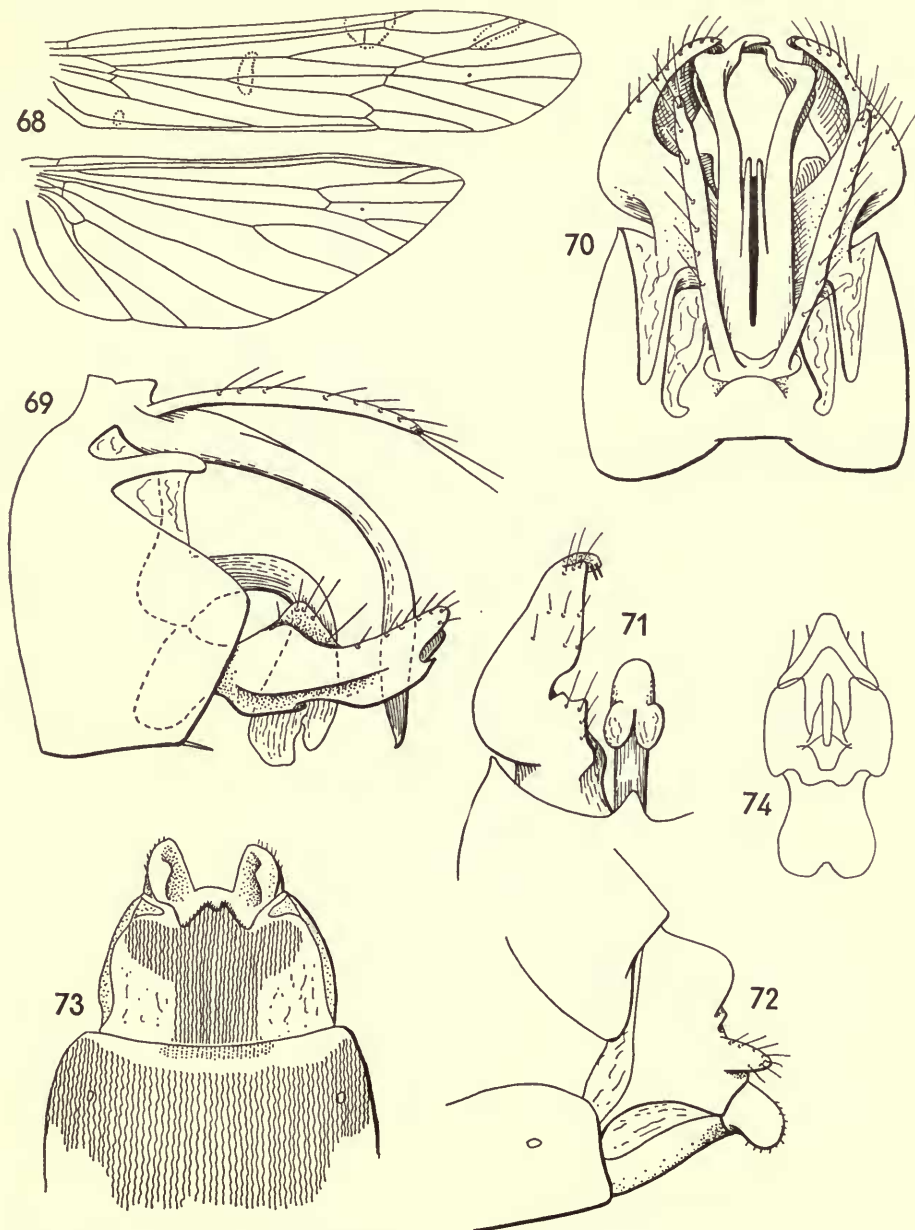
(Text-figs. 68-74)

(In alcohol.) Head piceous above, with piceous hairs, fuscous on front, hairs between antennae white. Antennae pale fuscous, with darker articulations, segments paler at base in basal half of antennae. Palpi piceous. Thorax piceous above, fuscous on sides. Femora mainly piceous, tarsi, tibiae and apices of posterior femora paler, the basal segment of both median and posterior tarsi whitish. Abdomen pale fuscous, apical segments fuscous. Membrane of fore wing fuscous, with three paler areas, a slightly lunate area extending from  $R_s$  across the base of the thyridial cell, a conspicuous triangular area at the base of the pterostigma, and a smaller streak extending obliquely forward and outward from the base of  $R_2$  to the apex of  $R_1$ . The pubescence is piceous, with whitish hairs on the paler areas of the membrane and, in unrubbed specimens, with scattered, elongate-oval, white, scale-like hairs along the main veins. These scale-like hairs are present in both sexes. In the fore wing, the discoidal cell is strongly constricted apically, as in *A. mandana* (Mosely). In the hind wing, the membrane is smoky hyaline, rather darker behind the media and with sparse fuscous pubescence.

♂ GENITALIA. Similar in general pattern to *A. mandana* (Mosely). The ninth segment has its ventral, apical margin less produced, the blunt lobe of *mandana* being represented by a very thin, triangular process. Side-pieces forming a right-angle and, from above them, on each side, arises a slender strut, projecting tailward and then ventrally and forming part of the basal attachment of the aedeagus. Tenth segment with four branches, the outer pair long, spiniform, curving downward and becoming somewhat sinuous apically in dorsal aspect. The inner branches are less than half as long as the outer, straight, slender and rather inconspicuous. Cerci long and slender. Aedeagus short, angled downwards, apex membranous and bilobed. Claspers much as in *mandana*, strong and caliper-like, inner ventral margins much more produced than in *mandana* and with a notch at about one-third from base. This ventral flange gives the apex of the clasper a trifold appearance. Outer margins of clasper strongly ridged, inner dorsal margin produced upward in a triangular lobe.



♀. Smaller than male and with the customary additional apical cell in the fore wing. ♀ GENITALIA. Eighth sternite broadly pigmented. Ninth tergite from above with apical margin forming two convex projections with a narrow excision between them. Cerci short and flattened, apices elliptical. Lateral gonapophyses short and rounded, inner surface with sinuous lobes.



FIGS. 68-74. *Athripsodes niveosquamosa* sp. n. 68, ♂ wings; 69, ♂ genitalia, lateral; 70, the same, dorsal; 71, ♂ clasper and aedeagus, ventral; 72, ♀ genitalia, lateral; 73, the same, ventral; 74, ♀ vaginal structure, ventral.



Subgenital plate with centre of its apical margin triangularly produced, its apex excised. The plate bears a large, mushroom-like pigmented area.

Length of fore wing, ♂, 9 mm., ♀, 7-8 mm.

Holotype ♂, Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961 (*A. Tjønneland*), BMNH, mounted as microscope preparations.

Allotype ♀, Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961 (*A. Tjønneland*), BMNH, in 2% formaldehyde solution, with abdomen mounted on holotype ♂ microscope slide.

Paratypes, Koka Dam, 29.iii.1961, 2 ♂, 1 ♀ (*A. Tjønneland*); Gojeb River, 10.iv.1961, 1 ♂, 1 ♀ (*G. Hodera*); Ghibe River, 260 km. from Addis Ababa, 6.v.1961, numerous ex., ♂, ♀; Awash River, near Hot Springs, 13.v.1961, 1 ♂ (*S. Chojnacky*); Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961, numerous ex., ♂, ♀ (*A. Tjønneland*), BMNH, UCAA.

This species is clearly related to *Athripsodes mandana* (Mosely), both in venation and in male genitalia. The differences in the latter are detailed in the foregoing description. In the wings, *A. mandana* also has the whitish area near the pterostigma but the other areas are not mentioned, nor does Mosely give the colour of the wings. The hind wing of *A. niveosquamosa* is rather broader than in *mandana*. The scale-like hairs on the main veins of the fore wing recall *A. aurifera* (Navás), described as a *Homilia*, but in that species the "scales" are golden yellow and the general description differs from *A. niveosquamosa*.

### *Leptocerina ramosa ramosa* (Ulmer)

(Text-figs. 75-78)

*Leptocerus ramosus* Ulmer, 1912: 103-105, figs. 27-29.

*Leptocerina ramosa* (Ulmer), Mosely, 1932: 298.

Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961, 3 ♂ (*A. Tjønneland*).

These three examples do not agree entirely with Ulmer's figures of *L. ramosa*. His figure is from a defective example, with the cerci missing, and the figures were made from a pinned example. In consequence, the aedeagus and tenth tergite are shown as a single structure. The claspers are similar in shape, although the upper branch is relatively a little longer and its inner dilatation more pronounced. These slight differences do not amount to a subspecific distinction and I propose to consider the Ethiopian examples as *L. ramosa ramosa* (Ulmer). In order that other workers may have the opportunity of forming their own opinions as to the identity of these specimens, I am giving figures of the wings and male genitalia.

Previous distribution: CAMEROONS.

### *Leptocerina spinigera* Mosely

Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961, 14 ♂ (*A. Tjønneland*).

Previous distribution: SIERRA LEONE.

*Leptocerina talopa* Mosely

Gofa village, 15 km. S. of Adolla, 17.iv.1960, 2 ♂ (*A. Tjønneland*).

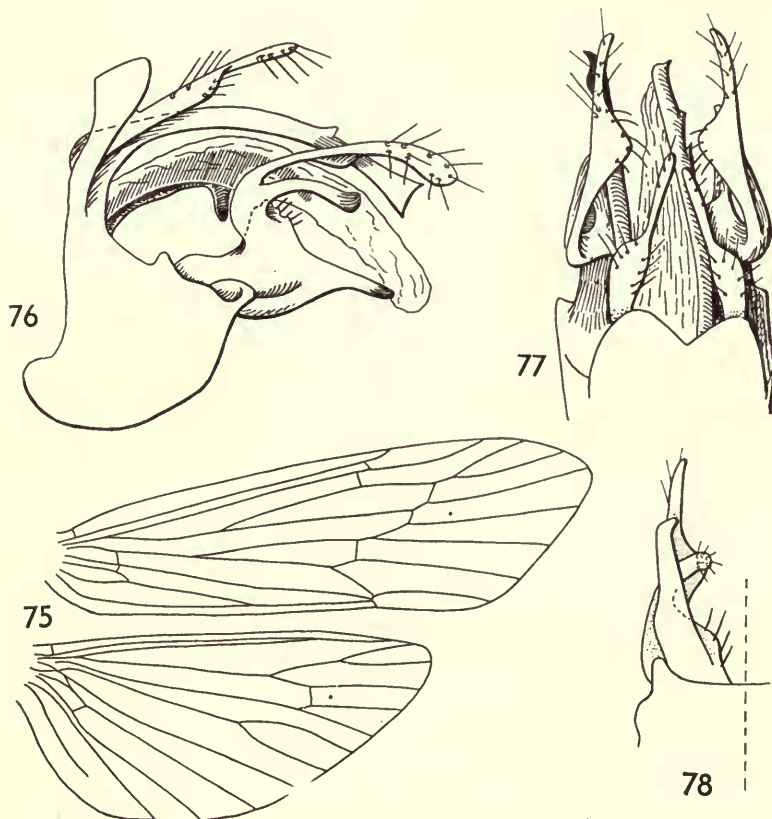
Previous distribution : UGANDA.

*Tagalopsyche aethiopica* sp. n.

(Text-figs. 79-86)

(In alcohol.) Head fulvous, eyes purplish. Postero-lateral warts strongly elevated, long, close to eye and about half as long as its diameter ; anterior warts small and circular. Antennae with two basal segments pale fulvous, remainder luteous, with fuscous articulations, which fade out apically. Palpi pale fuscous, maxillary densely fringed with fuscous hairs, segments two and three long, subequal, one a little shorter than two but longer than four, five shortest. Thorax pale yellowish brown. Legs pale fulvous, with fuscous pubescence, spurs 0.2.2. Abdomen pale luteous, the tergites and sternites faintly shaded with fuscous. Fore wing densely clothed with short, pale fuscous pubescence, the main veins with tufts of darker, more upstanding pubescence. Hind wing with sparse fuscous pubescence.

♂ GENITALIA. Ninth segment short, the centre of its ventral apical margin produced in a



FIGS. 75-78. *Leptocerina ramosa ramosa* (Ulmer), ♂. 75, wings ; 76, genitalia, lateral ; 77, the same, dorsal ; 78, left clasper, ventral.

short, transverse lobe, whose base is also extended upwards in a tongue beneath the aedeagus. Tenth segment fused to ninth, in side view forming a triangular hood over aedeagus. From above, it is broad basally, with two rounded, median projections; the apex is narrow and spatulate. Cerci narrow, elongate, about as long as tenth segment. Aedeagus short, arched downwards, from beneath dilated about midway. Clasper from the side rather narrow at base, upper apical angle produced upwards in a rounded lobe, lower apical angle curving inwards to meet the other clasper. The upper branch has an internal longitudinal ridge, armed with setae.

♀ GENITALIA. Ninth segment short above, lateral gonapophyses large, about three times as long as wide, directed obliquely downwards, base constricted. From beneath, they are somewhat sinuous. Subgenital plate broad, apex four-lobed, outer lobes much larger than inner, apices rounded. Tenth segment fused with ninth, cerci about half as long as lateral gonapophyses, slender, acute.

Length of fore wing, ♂, 8.5 mm., ♀, 9 mm.

Holotype ♂, Lake Awasa, 6. xi. 1960 (*A. Tjønneland*), BMNH, mounted as microscope preparation.

Allotype ♀, Lake Awasa, 6. xi. 1960 (*A. Tjønneland*), BMNH, in 2% formaldehyde solution, abdomen mounted as a microscope preparation.

Paratypes, Lake Awasa, 6, 27. xi. 1960, 12 ♂, 3 ♀; Koka Dam, 29. iii. 1961, 1 ♂; Black River, near Lake Awasa, 15. iv. 1961, 3 ♂, 2 ♀ (*A. Tjønneland*), BMNH, UCAA.

This species has been placed in the hitherto oriental genus *Tagalopsyche* on the general similarity of the venation and of the male and female genitalia. In the hind wing, fork  $Cu_{1a}$  is perhaps a little shorter than in the typical species, *T. sisyroides* Banks. I can see no spur on the anterior tibia, but I do not attach much importance to this, as the spur in *T. brunnea* (Ulmer) is very short. Male and female genitalia are also very similar to those in the genus *Mystacides*, from which it differs in the venation of the fore wing, fork  $R_2$  being stalked, the discoidal cell being short, costal margin not notched nor the apex of the wing deflexed and the anastomosis is straight, not oblique. In male genital structure, *T. aethiopica* differs from *T. brunnea* in details of the claspers.

### *Oecetis pangana* Navás

Kimmins, 1961 : 244-245, figs. 5-7.

Koka Dam, 29. iii. 1961, 3 ♀; Ghibe River, 215 km. from Addis Ababa, 13-14. v. 1961, numerous ex. (*A. Tjønneland*); Ghibe River, 260 km. from Addis Ababa, 6. v. 1961, a few ex. (*S. Chojnacky*).

Previous distribution : CONGO and SENEGAL.

### *Oecetis setifera* Ulmer

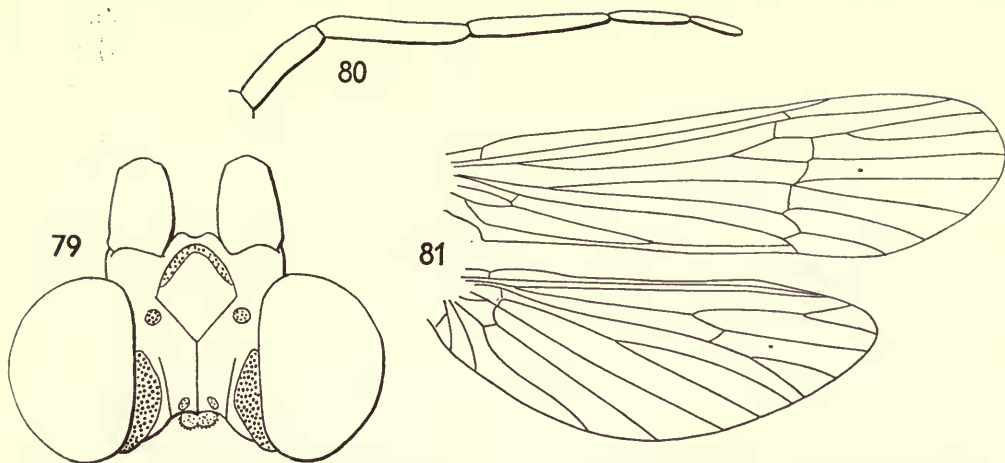
(Text-figs. 87-89)

Ulmer, 1922 : 59-61, figs. 18-21a (Holotype ♂, Mus. A. Koenig, Bonn).

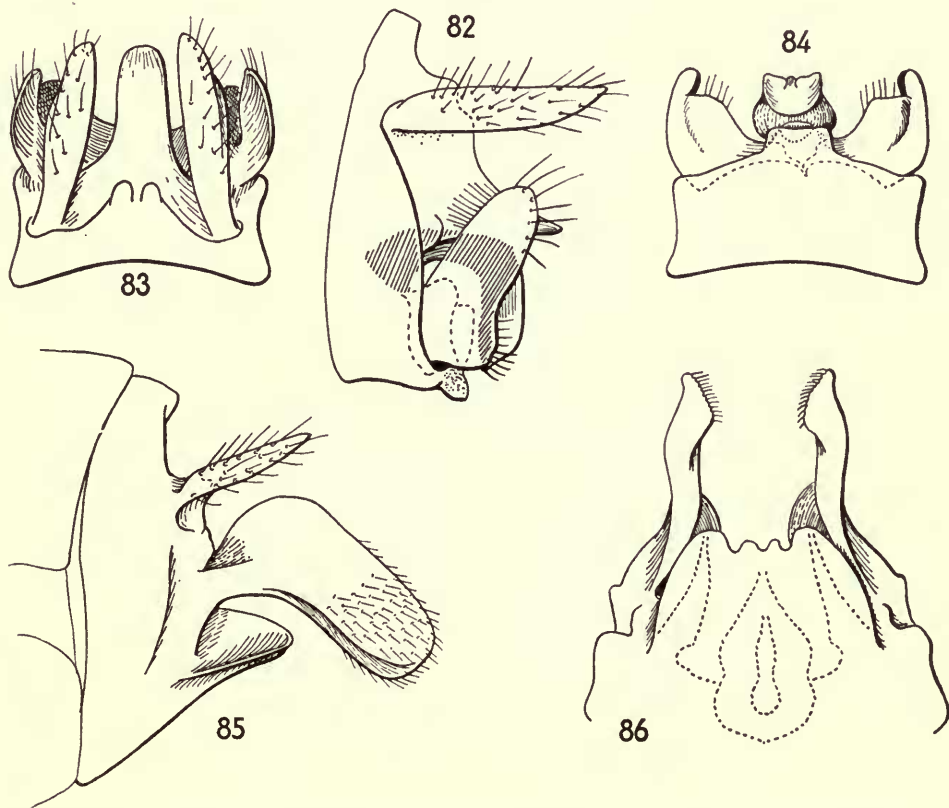
*Oecetis choa* Mosely, 1948a : 34-36, figs. 5-8, **syn. n.**, (Holotype ♂, BMNH).

Lake Awasa, 6, 27. xi. 1960, numerous ex.; Lake Margherita, 8-9. iv. 1961, a few ex. (*A. Tjønneland*).

*Oecetis choa* Mosely was described from a single male, taken at Lake Nyasa.



FIGS. 79-81. *Tagalopsyche aethiopica* sp. n. ♂. 79, head, dorsal; 80, maxillary palpus; 81, wings.

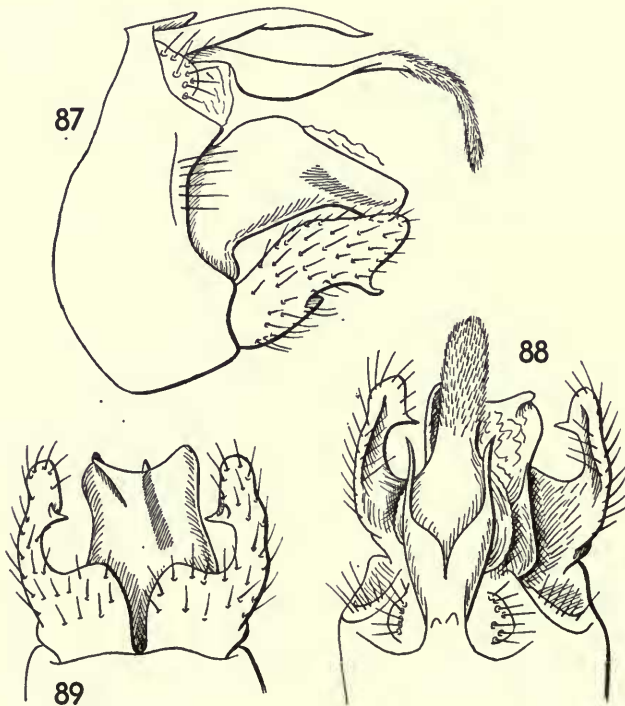


FIGS. 82-86. *Tagalopsyche aethiopica* sp. n. Genitalia. 82, ♂ lateral; 83, ♂ dorsal; 84, ♂ ventral; 85, ♀ lateral; 86, ♀ ventral.

Mosely comments on the similarity to *O. setifera* Ulmer and distinguishes it from that species on the form of the aedeagus (lower penis-cover) and in having reticulated areas on the fifth to eighth tergites only. Since then I have seen material from other localities, all agreeing with *O. choa* in the arrangement of the reticulated areas on the tergites, but with the male genitalia more like *setifera* (apart from the form of the aedeagus). Recently, Dr. B. Mannheims, of the Museum A. Koenig, Bonn, has been kind enough to send me the type of *O. setifera* Ulmer for study. This has revealed that there are in fact reticulated areas on four tergites only, the fifth to the eighth, and that the genitalia are identical with specimens from Ethiopia. The genitalia differ slightly from those of *O. choa*, but the difference is insufficient to be of specific importance.

I take this opportunity to designate as LECTOTYPE of *Oecetis setifera* Ulmer the first male listed by him, labelled "Gebel Ain (Bahr el Abiad), 18.ii.1913", "*Oecetis setifera* Ulm." and my own lectotype label. The specimen is in alcohol, in the Museum A. Koenig, Bonn. New figures of the male genitalia are given, from Ethiopian material.

Distribution: Ulmer's types were from the EGYPTIAN SUDAN, the type of *O. choa* Mosely was from LAKE NYASA and I have seen other examples from LAKE VICTORIA.



FIGS. 87-89. *Oecetis setifera* Ulmer, ♂ genitalia. 87, lateral; 88, dorsal; 89, claspers and aedeagus, ventral.



*Oecetis montana* Ulmer

(Text-figs. 90-91)

Ulmer, 1930 : 495-497, figs. 18-19 (Holotype ♀, Ethiopia, BMNH).

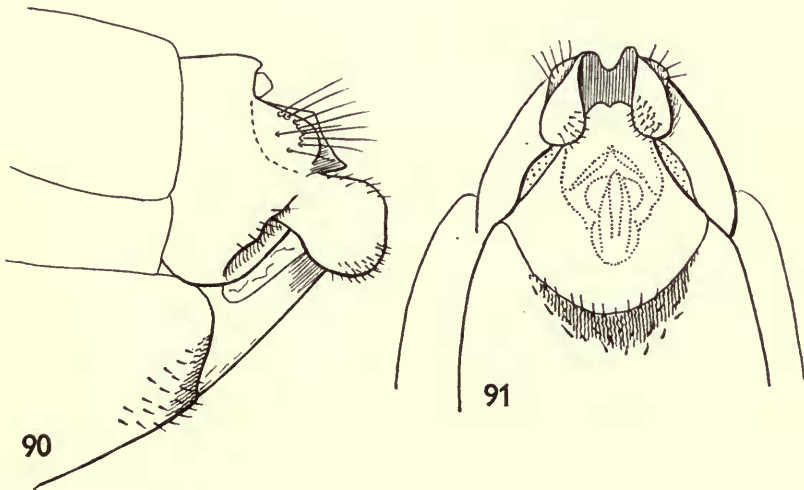
The abdomen of the holotype has been removed and cleared in KOH solution, to enable a new description and figures to be made. Eighth sternite with its apical margin concave, rather strongly pigmented and bearing a number of widely-spaced, short setae. Ninth tergite more or less fused with the tenth, the cerci represented by rounded lobes on each side of the tubular tenth segment, which is obliquely truncate in side view, ventral margin excised. Lateral gonapophyses somewhat pyriform in side view, convex on outer surfaces, apices incurved. Subgenital plate tapered obliquely upward between the lateral gonapophyses, in ventral view tapering to a narrow, slightly bilobed apex. Internal structures as indicated in figures.

*Oecetis tjonnelandi* sp. n.

(Text-figs. 92-94)

(In alcohol.) Head medium fuscous, rather darker on occiput and paler on face. Antennae pale fuscous, articulations darker. Palpi dark fuscous, with fuscous pubescence. Thorax above warm brown, with paler markings. Legs pale fuscous. Fore wing pale fuscous, with darker markings over the anastomosis and main forks. Hind wing smoky hyaline, with fuscous veins. Both wings with sparse fuscous pubescence (possibly denuded), anal fringe of hind wing long and piceous. Venation as in *O. setifera* Ulmer. Reticulated areas on fifth to eighth abdominal tergites.

♂ GENITALIA. Ninth and tenth tergites fused, the centre of the dorsal apical margin produced in a pair of slender, adjacent spines, clothed with fine setae apically. Side-pieces of ninth segment short, serrate and setose. Aedeagus stout, cylindrical at base, open dorsally towards apex and filled with membrane. It is slightly asymmetric, the left lateral margin being curved outward. Apex bilobed. Clasper in side view short, quadrate, with a brief finger on upper apical angle



FIGS. 90-91. *Oecetis montana* Ulmer, genitalia of ♀ type. 90, lateral; 91, ventral.

and with a long, curved spine arising from the upper basal angle. The spine is directed basally at first, then arched over caudad and downward. From beneath, the clasper is broad basally, the upper outer margin curving outwards, the inner margin tapering sinuously towards the apex, and with a strong, pre-apical spine directed medially.

Length of fore wing, ♂, 6 mm.

Holotype ♂, Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961 (*A. Tjønneland*), BMNH, mounted as microscope preparations.

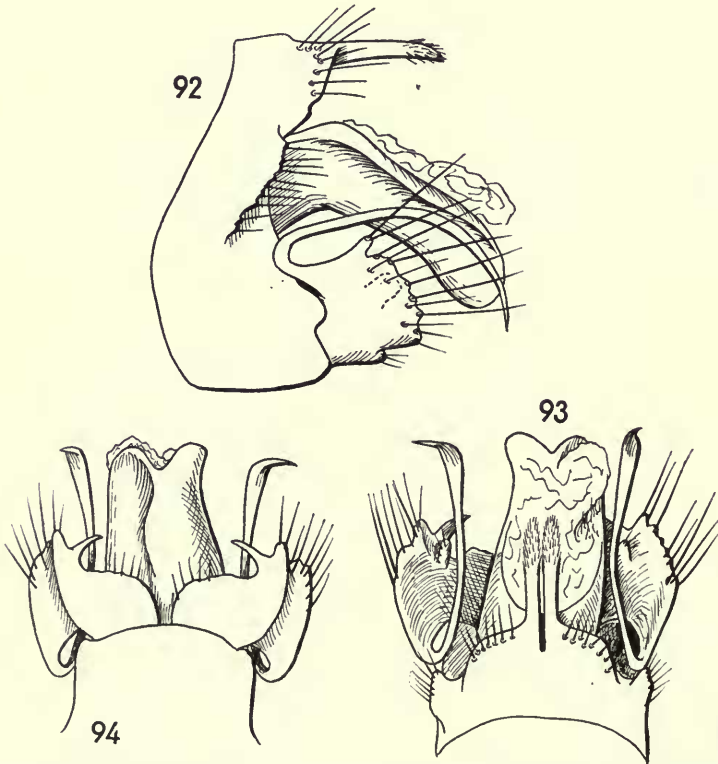
Paratypes, Ghibe River, 260 km. from Addis Ababa, 6.v.1961, 3 ♂ (*S. Chojnacky*); Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961, 3 ♂ (*A. Tjønneland*), BMNH, UCAA.

The presence of reticulated areas on the fifth to eighth tergites of the male shows a relationship to *O. setifera* Ulmer and *O. reticulatella* Kimmins. The clasper, although very different in side view, has a pre-apical spine similar to that of *O. setifera* and the shape of the clasper in ventral view also recalls that species.

### *Oecetis brunnescens* (Ulmer)

Lake Awasa, 6, 27.xi.1960, numerous ex. (*A. Tjønneland*).

Previous distribution: EGYPTIAN SUDAN.



FIGS. 92-94. *Oecetis tjønnelandi* sp. n. ♂ genitalia. 92, lateral; 93, dorsal; 94, claspers and aedeagus, ventral.

***Oecetis ghibensis* sp. n.**

(Text-figs. 95-101)

(In alcohol.) Head dark brown, antennae pale fulvous, with fine piceous annulations, the two basal segments fuscous. Maxillary palpi fuscous, with fuscous pubescence, labial palpi paler. Thorax dark brown, legs pale fuscous. Wings largely denuded, membrane of fore wing shaded with fuscous in basal third, from *C* to *Cu*<sub>1a</sub>; cross-veins of anastomosis, forks of *Rs*, *M-Cu* and *Cu*<sub>1</sub> shaded with fuscous, as are apices of veins. Hind wing faintly smoky. In fore wing, the discoidal cell is distinctly longer than its footstalk, about equal to median cell. The cross-vein closing the discoidal cell is oblique, its posterior end nearer to apex. Abdomen pale fuscous above, the fuscous marking becoming obsolete on terminal segments.

♂ GENITALIA. Ninth segment short, side-pieces only slightly produced. Tenth segment and cerci fused, forming a short hood, the tenth segment projecting beyond the cerci in a slightly sclerotized lobe, excised to form a wide V in dorsal view, appearing as a short, rounded lobe in side view. Aedeagus somewhat globular, its apex extended in a short, slightly curved finger in side view. Within the aedeagus is a single spine. Clasper broad and flattened in ventral view, outer margin convex, with a shoulder before the spatulate apex, inner margin sinuous. In side view, the clasper is almost straight, the shoulder appearing as a small triangular projection on upper margin.

♀ GENITALIA. Eighth sternite with a concave, transverse band of pigmentation towards the apex. Subgenital plate broadly cordate. Ninth tergite short and deep. Lateral gonapophyses longer than ninth tergite, directed downwards and outwards, so that the outer surface is concave, upper and lower angles rounded. Cerci fused to tenth segment, forming the dorsal surface of a hood, whose apex is bent downwards and projects caudad.

Length of fore wing, ♂, 7 mm., ♀ 6.5 mm.

Holotype ♂, Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961 (*A. Tjonne-land*), BMNH, mounted as microscope preparations.

Allotype ♀, Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961 (*A. Tjonne-land*), BMNH, mounted as microscope preparations.

Paratypes, Koka Dam, 29.iii.1960, 1 ♂; Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961, 21 ♂, 6 ♀ (*A. Tjonne-land*), BMNH, UCAA.

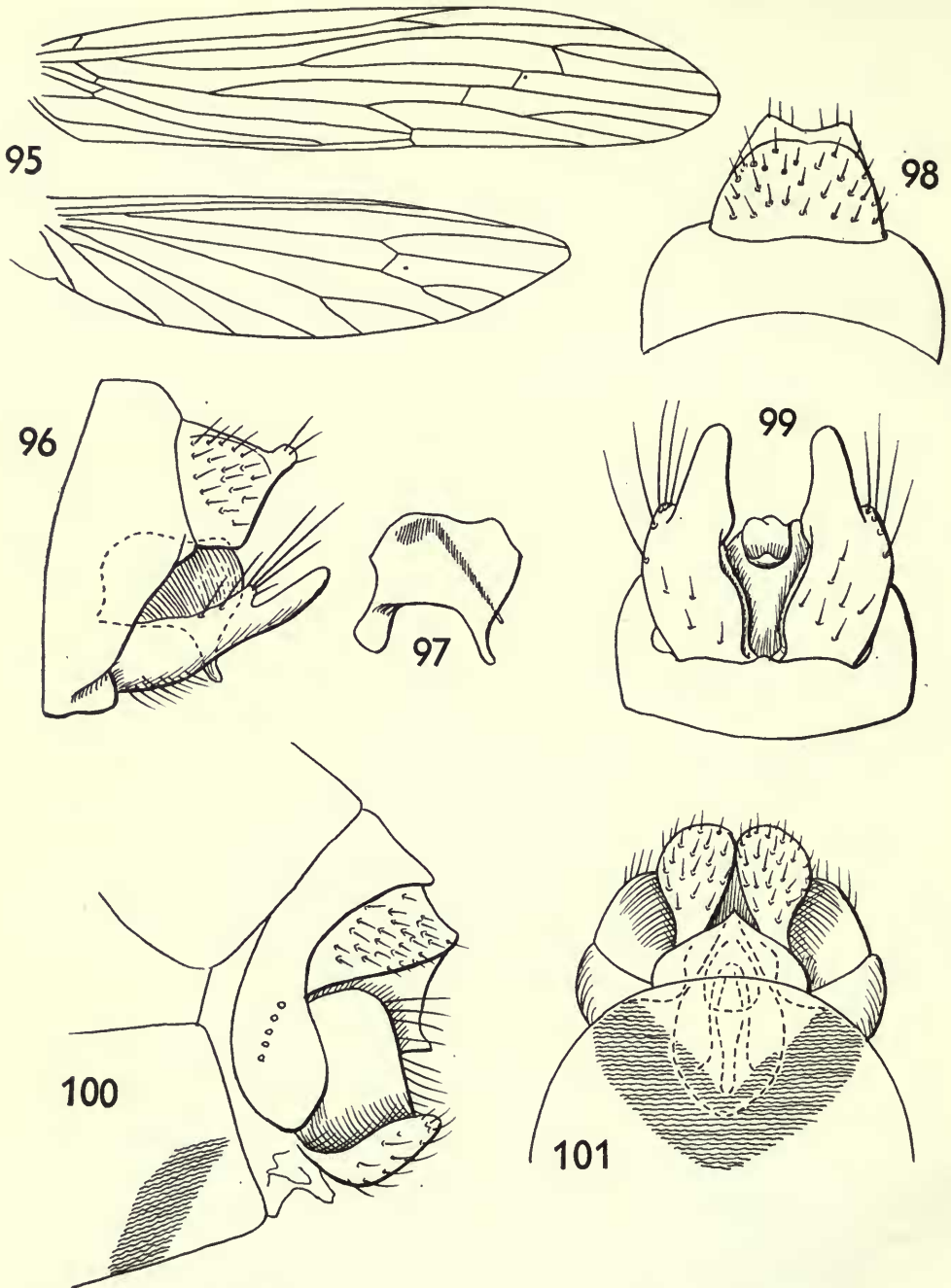
This species is related to *O. lucipetens* Barnard, from South Africa. It differs in the longer discoidal cell in the fore wing, the broader apex to the tenth segment and larger cerci in the male and narrower apex of the aedeagus. The female is associated with the male on the evidence of the wing venation. The genitalia show some resemblance to those of *O. ovampoensis* Barnard.

***Oecetis brevis* sp. n.**

(Text-figs. 102-107)

(In alcohol.) Head pale fuscous, vertex slightly darker. Antennae finely annulated with piceous at articulations. Palpi pale fuscous, with fuscous pubescence. Thorax yellowish brown, legs pale fuscous. Fore wing pale fuscous, rather denuded, but with traces of fuscous pubescence. Cross-veins of anastomosis shaded with fuscous. Hind wing pale smoky hyaline. In fore wing, the bases of the discoidal and median cells are at approximately the same level, anastomosis forming an almost straight line. Apical cells long and narrow.

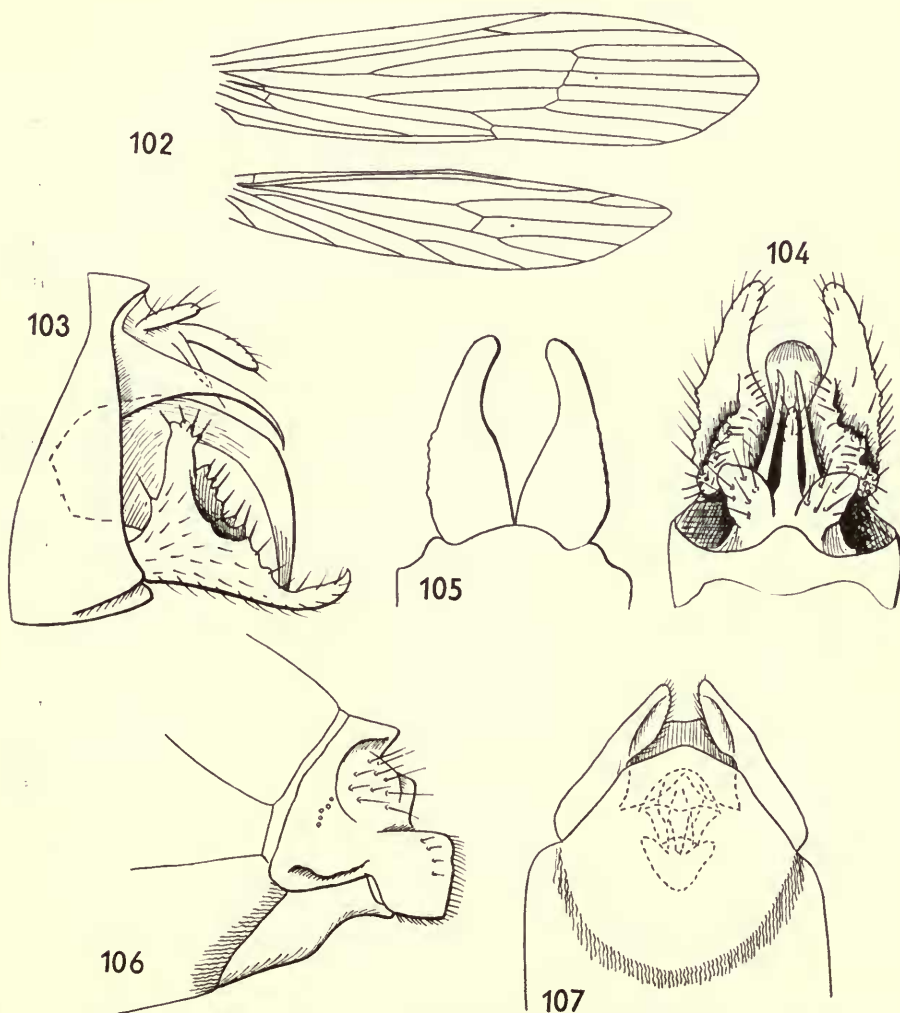
♂ GENITALIA. Ninth segment rather narrow above, the centre of the apical produced in a small, rounded lobe. No obvious side-pieces. Tenth segment partly fused to ninth, trilobed, the median lobe slender and digitate, shorter than the lateral lobes, which form slender, down-curving spines, placed above the aedeagus. On either side of the median lobe is a slender,



FIGS. 95-101. *Oecetis ghibensis* sp. n. 95, ♂ wings; 96, ♂ genitalia, lateral; 97, ♂ aedeagus, lateral; 98, ♂ ninth and tenth tergites, dorsal; 99, ♂ claspers and aedeagus ventral; 100, ♀ genitalia, lateral; 101, the same, ventral.

transparent finger, terminating in a bristle. These fingers are not visible from above. Aedeagus stout basally, curving downwards in a tapering spine. Clasper shorter and broader than in related species, the upwardly directed basal branch with an inner ridge paralleling the upper margin of the clasper, both the basal branch and its inner ridge heavily clothed with short spines arising from elevated bases. Apex of clasper slender, slightly upcurved and acute in lateral aspect.

♀ GENITALIA. Eighth segment with apical margin excised and pigmented, subgenital plate broad and tapering to an obtuse apex, lateral margins angled. Ninth segment of moderate length, apical dorsal margin produced in the centre in a rounded lobe. Cerci appearing as slightly convex plates fused to the anal tube, which extends slightly beyond them. Lateral gonapophyses more or less quadrate in side view, lower margin slightly incurved in ventral view. Within the base of the abdomen can be seen a large oval sac, connected with the genital area by a



FIGS. 102-107. *Oecetis brevis* sp. n. 102, ♂ wings; 103, ♂ genitalia, lateral; 104, the same, dorsal; 105, ♂ claspers, ventral; 106, ♀ genitalia, lateral; 107, the same, ventral.



long, tapering, convoluted tube. The actual point of attachment is obscure. The surface of the sac is densely and finely pitted, the pits appearing dark in uncleared specimens.

Length of fore wing, ♂, 6.5 mm., ♀, 5 mm.

Holotype ♂, Ghibe River, 260 km. from Addis Ababa, 6.v.1961 (*S. Chojnacky*), BMNH, mounted as microscope preparations.

Allotype ♀, Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961 (*A. Tjønneland*), BMNH, in 2% formaldehyde solution, abdomen mounted as microscope preparation.

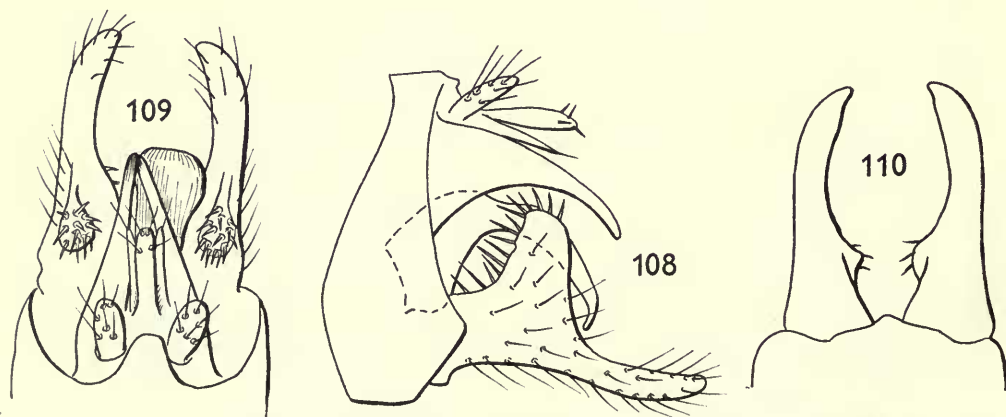
Paratypes, Ghibe River, 260 km. from Addis Ababa, 6.v.1961, 1 ♂ (*S. Chojnacky*); Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961, 3 ♂, 3 ♀ (*A. Tjønneland*), BMNH, UCAA.

This species clearly belongs to the *modesta* group of species and comes closest to *O. acuta* Ulmer (Natal). The description and figure of the genitalia of *O. acuta* give no indication of a basal branch to the clasper and I am therefore giving new figures from the type (Text-figs. 108-110). In *brevis* the outer lobes of the tenth segment are narrower basally, the aedeagus is relatively longer and more evenly curved. The basal branch of the clasper is narrower at its apex and more serrate in its outline, and in ventral view the basal part of the clasper is broader. In the female presumed to be that of *brevis*, the genitalia resemble those of *O. montana* Ulmer, but differ in the shape of the lateral gonapophyses, the subgenital plate and the internal structure.

#### *Oecetis* spp. ♀

In the absence of any correlated males, the following specimens have not been determined beyond the genus.

Dawa River, 12 km. N. of Hudat, 12.iv.1961, 1 ♀ (*A. Tjønneland*); Ghibe River, 260 km. from Addis Ababa, 6.v.1961, 4 ♀ (*S. Chojnacky*); Gamo Prov., Gughé



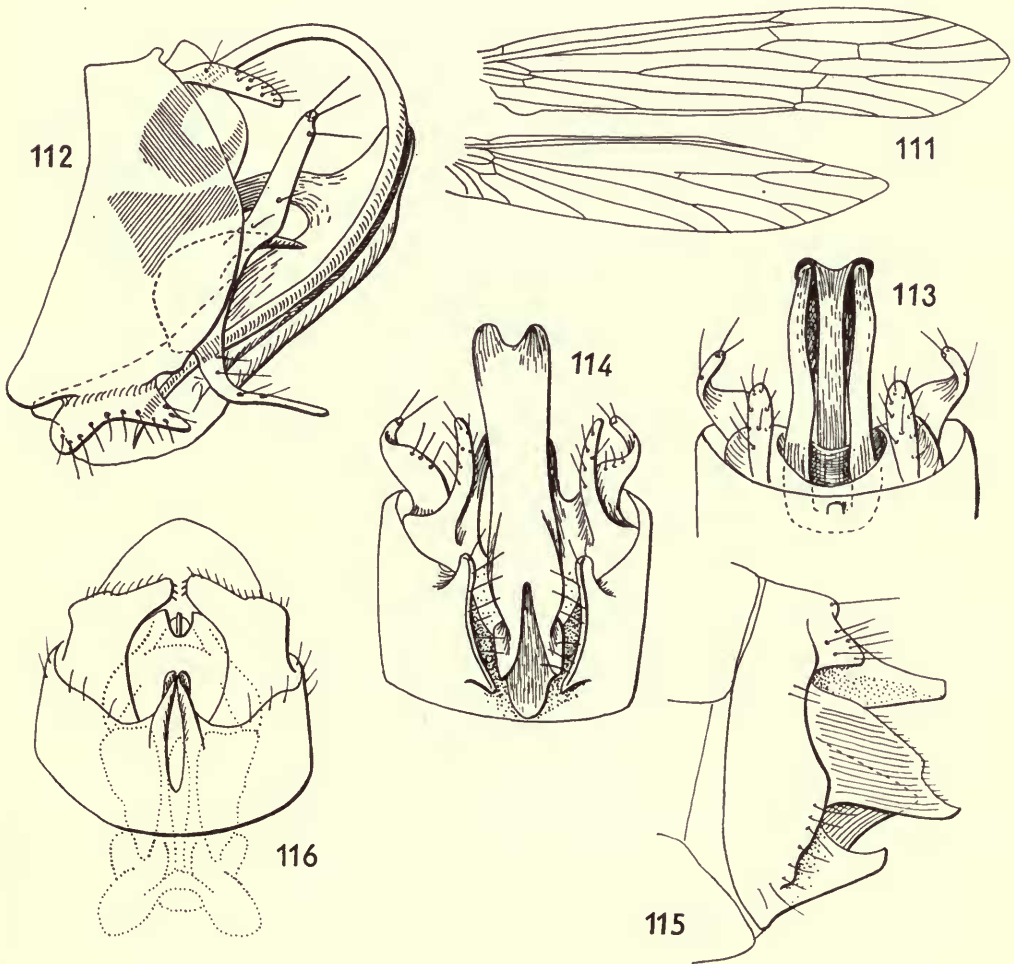
FIGS. 108-110. *Oecetis acuta* Ulmer, genitalia of ♂ type. 108, lateral; 109, the same, dorsal; 110, claspers, ventral.

Highlands, Bonghé, c. 9,000 ft., 29.xii.1948, 1 ♀ (*H. Scott*); Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961, 2 ♀ (*A. Tjønneland*); these two females appear to be different species, either of which might be the female of *O. tjønnelandi* Kimmins.

*Setodes aethiopica* sp. n.

(Text-figs. III-III6)

The specimens were collected at light and preserved in alcohol. Little can be said of their general appearance, since the wings are almost completely denuded. The general colour of the head and thorax is a pale cream, tinged with brownish.



FIGS. III-III6. *Setodes aethiopica* sp. n. III, ♂ wings; II2, ♂ genitalia, lateral; II3, the same, dorsal; II4, the same, ventral; II5, ♀, genitalia, lateral; II6, the same, ventral.

Antennae pale cream, finely annulated with reddish at the articulations, palpi whitish. Legs whitish, spurs 0.2.2. Fore wing faintly tinged with brownish, with faint, hyaline, longitudinal lines between some of the main veins, suggesting that the wing may have streaks of whitish or silver pubescence. Hind wing hyaline. Venation as in Text-fig. III. Abdomen whitish, terminal segments cream.

♂ GENITALIA similar in pattern to *S. alala* Mosely and *S. excisa* Kimmins. Ninth segment with a small, quadrate process projecting from near the centre of the apical margin. Ventrally the ninth segment has a deep median depression, the lateral margins of the depression each produced ventrally in a thin, bifid plate. Between these produced lateral margins of the depression are partially concealed the apex of the aedeagus and the tips of the lateral spines of the tenth segment. The tenth segment appears to form a short anal tube, from the outside of which arise the short, digitate cerci. From within the tube arise a pair of very long, slender spines, directed caudad and recurved downward and cephalad on each side of the aedeagus, the apices resting, as previously mentioned in the median depression of the ninth sternite. The aedeagus is slender in its basal third and then bent sharply downwards and cephalad. At the point of bending, the dorsal surface is elevated and produced outwards to form a groove on each side of the stem in which the apical half of the spines of the tenth segment rest. This raised part of the aedeagus also has a median groove on its dorsal surface. Seen from beneath, the dorsal apical margin of the aedeagus has a deep V-shaped excision, the ventral apical margin being spatulate. Clasper from the side partly concealed by the margin of the ninth segment, divided into three slender branches, one directed upwards and curving inwards, the second, arising near its base on the inner surface, forms a short, curved spine, directed caudad. The third and most slender branch is directed downward and then caudad and slightly outward.

♀ GENITALIA. Ninth segment synscleritous, its ventral apical margin produced in a pair of thin plates, triangular in side view, with truncate apices, separated by a narrow excision in ventral view. Tenth tergite forming a thin, convex hood, its apex rounded in ventral view, truncate in side view. Cerci short, triangular. Lateral gonapophyses thin and plate-like, somewhat triangular in side-view, apices incurved in ventral view. Between the gonapophyses in ventral view can be seen a rounded plate with a U-shaped median excision, and within the excision a smaller rounded plate bearing a slender, median finger.

Length of fore wing, ♂, 4.8 mm., ♀, 4.4 mm.

Holotype ♂, Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961 (*A. Tjønneland*), BMNH, mounted as microscope preparations.

Allotype ♀, Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961, (*A. Tjønneland*), BMNH, mounted as microscope preparations.

Paratypes, Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961, numerous ex., ♂, ♀, (*A. Tjønneland*), BMNH, UCAA.

This species is clearly allied to *S. alala* Mosely from SW. Arabia. The genitalia in both sexes are of the same general pattern, and the pigmentation of the fore wing suggests that this wing formerly bore a similar pattern of silver or white lines on a yellowish ground. The male genitalia differ in the more strongly arched aedeagus, whose dorsal surface is elevated and produced laterally to provide grooves for the spines of the tenth tergite. The clasper is reduced to three slender branches and the lateral margins of the median ventral depression of the ninth segment are produced in bilobed plates. In the female, the apical margin of the tenth segment is entire, the lateral gonapophyses are triangular in side view and the two ventral processes of the ninth segment are closer together.

*Setodes pallida* sp. n.

(Text-figs. 117-121)

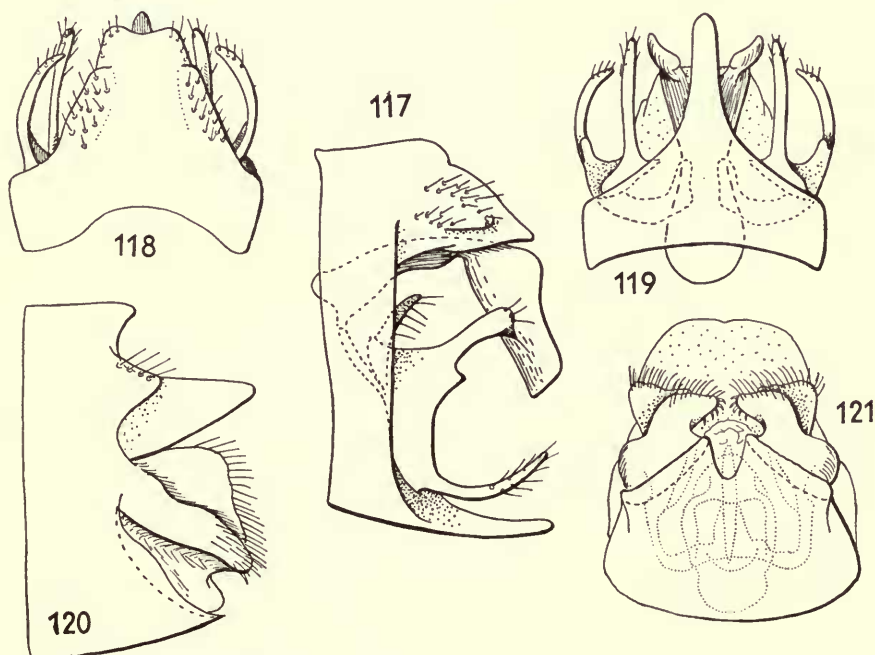
Specimens preserved in alcohol and much rubbed, wings with traces of yellowish pubescence. General colour creamy white, eyes purplish black. Spurs 0.2.2. Wing venation as in *S. trifida* Kimmins.

♂ GENITALIA. Ninth segment laterally compressed, its width about two-thirds of its height. Apical ventral margin produced in a long, tapering median process. Tenth segment fused to ninth, forming a dorsal hood, tapering to an acute apex in side view, truncate and shallowly excised in dorsal view. Near the base on each side is a low, setiferous wart, possibly a reduced cercus. Aedeagus slender basally in side view, abruptly angled downwards about midway, dilated, the apex excised and diverging laterally. Clasper with three slender branches; a short one below the aedeagus; an outer one, arising from a broad base and curving inwards and a ventral branch, curving upwards and about as long as the ventral process of the ninth segment.

♀ GENITALIA. Ninth segment synscleritous. Dorsal apical margin produced in a small triangular lobe; ventral apical margin triangularly produced, with a U-shaped apical excision. Tenth segment forming a thin and broad rounded plate, its lateral margins deflexed so that it appears triangular in side view. On each side at the base is a triangular, setiferous lobe. Lateral gonapophyses in the form of two overlapping, fringed plates, the outer one narrower than the inner, incurved and dentate apically.

Length of fore wing, ♂, 6.7 mm., ♀, 5.4 mm.

Holotype ♂, Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961, (*A. Tjønneland*), BMNH, mounted as microscope preparations.



FIGS. 117-121. *Setodes pallida* sp. n. 117, ♂ genitalia, lateral; 118, the same, dorsal; 119, the same, ventral; 120, ♀ genitalia, lateral; 121, the same ventral.



Allotype ♀, Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961, (*A. Tjønneland*), BMNH, in 2% formaldehyde solution, abdomen mounted as a microscope preparation.

Paratypes, Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961, 16 ♂, 27 ♀, (*A. Tjønneland*), BMNH, UCAA.

This species is allied to *S. trifida* Kimmins, from Kenya, in the general pattern of male and female genitalia. In the male, it may be distinguished by the more triangular tenth segment, with a truncate apex in dorsal view, the much shorter upper and the more slender, digitate lower branch of the clasper, and the strongly produced ventral process of the ninth sternite. The female differs in the more broadly triangular shape of the tenth segment in lateral view, the lateral gonapophyses and the narrower excision of the ninth sternite.

### *Setodes squamosa* Mosely

Koka Dam, 29.iii.1961, a few ex. (*A. Tjønneland*).

Previous distribution : NATAL.

### *Trichosetodes tjønnelandi* sp. n.

(Text-figs. 122-127)

The specimens were collected in alcohol and are considerably denuded. Head tawny, probably with a pair of narrow lines of white hairs running back from the antennae. The latter are tawny, the long basal segment with traces of scale-like hairs and, in the ♂, a terminal tuft of fine hairs, the succeeding segments finely annulated with reddish apically. Palpi tawny, with sparse fuscous pubescence. Thorax fuscous above, with pale warts and a pair of parallel, longitudinal, pale lines, bearing traces of white, scale-like hairs, on the mesonotum. Legs luteous, with sparse fuscous pubescence. Wings narrow, membrane of fore wing pale fuscous, with traces of fuscous pubescence and narrow scale-like hairs. Abdomen creamy, terminal segments tawny.

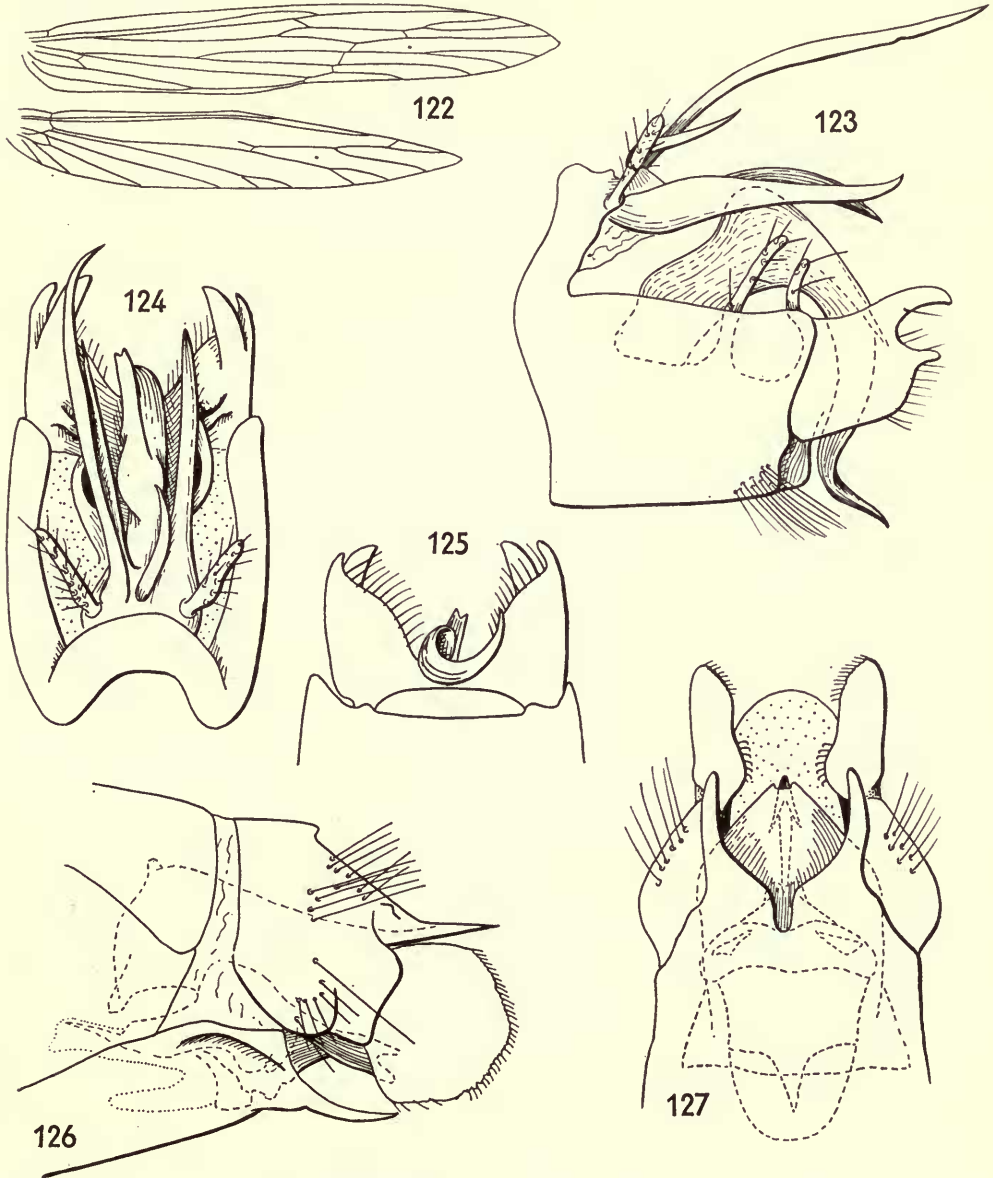
♂ GENITALIA. Ninth segment long ventrally, cut back dorsally to a short, transverse band. Tenth segment short, giving rise to two pairs of spines, the cerci slender, short and more or less erect. The inner pair of spines are very asymmetric, the left one short, directed upwards and then sharply angled caudad. The right-hand spine is very long and slender, extending caudad beyond the apices of the claspers. The outer pair of spines are only slightly asymmetric, stouter than the inner pair and not reaching as far as the apices of the claspers. Aedeagus strongly arched downwards, its upper surface humped at the angle. It is obscurely divided into a short upper spine, tapering to an excised apex and a much longer lower spine, which extends ventrally between the claspers and is twisted spirally towards the apex. The claspers are roughly quadrate in side view, the upper apical angle produced in a tapering finger curving slightly inwards and downwards. Below this finger is a shorter process, also slightly incurved. From beneath, the clasper is subtriangular, the inner margin sinuous. From the basal part of the clasper arise two slender, digitate processes, directed upwards beside the aedeagus.

♀ GENITALIA. The ninth tergite forms a large saddle, with the tenth tergite fused to it and projecting in a thin plate with a rounded apex. Lateral gonapophyses rounded and plate-like, fringed with short setae and with a group of hooked setae on inner surface at ventral angle.



Eighth sternite produced in a subgenital plate, which is widely and deeply excised at its apical margin, the sides of the excision sinuously curved so that the base of the excision is narrow and parallel sided. The apices of the subgenital plate form slender fingers. Above this excision is a thin, triangular plate with a narrow excised apex. Vaginal structure strongly sclerotized and fused to a conspicuous cylindrical structure.

Length of fore wing, ♂, 5·8–6·2 mm., ♀, 5–5·6 mm.



FIGS. 122–127. *Trichosetodes tjonnelandi* sp. n. 122, ♂ wings; 123, ♂ genitalia, lateral; 124, the same, dorsal; 125, ♂ claspers and aedeagus, ventral; 126, ♀ genitalia, lateral; 127, the same, ventral.

Holotype ♂, Koka Dam, 29.iii.1961 (*A. Tjønneland*), BMNH, mounted as microscope preparations.

Allotype ♀, Koka Dam, 29.iii.1961 (*A. Tjønneland*), BMNH, in 2% formaldehyde solution, abdomen mounted as microscope preparation.

Paratypes, Koka Dam, 29.iii.1961, 4 ♂, 3 ♀ (*A. Tjønneland*), BMNH, UCAA.

The male somewhat resembles *T. semibrunnea* Ulmer in genitalia, but differs in having four, instead of two, spines arising from the tenth segment, the aedeagus is more sinuous and with a spiral apex and the clasper has two branches along the upper margin near the base. There is no second branch on the ventral margin and the form of the apical processes is different. The female resembles *T. anysa* Mosely in having an excised subgenital plate, but the excision is much larger and the lateral processes are consequently larger. There is a smaller thin tenth tergite in *anysa*, not mentioned nor shown in the figures of that species.

### *Trichosetodes similis* sp. n.

(Text-figs. 128-133)

Insects collected in alcohol. In general appearance closely resembling *T. tjønnelandi* but smaller, and separable from that species by differences in the male and female genitalia.

♂ GENITALIA. Tenth tergite produced in two pairs of asymmetric spines. The left-hand spine of the inner pair about half as long as the right-hand one, slender and arched, right-hand spine extending beyond apices of claspers. Outer pair of spines rather longer than in *tjønnelandi*, the right-hand spine also exceeding the apices of the claspers. Cerci rather stouter in side view, flattened laterally. Aedeagus less stout at base than in *tjønnelandi*, directed upwards in side view and arching downwards between the claspers. It is similarly divided into a short upper and a long lower spine. The apex of the spine is less spirally curved. Claspers in side view longer and narrower, the upper apical branch directed obliquely upward, the lower branch either simple or cleft. The lower margin of the clasper is sinuous rather than convex.

♀ GENITALIA. Externally rather similar in structure. The tenth tergite is shorter and slightly angled upwards in side view. The lateral gonapophyses are rather more pyriform in side view. The produced angles of the subgenital plate are not so far apart and the base of the excision between them is not further deepened by a narrow, U-shaped excision. Internally there are very noticeable differences in the vaginal structure.

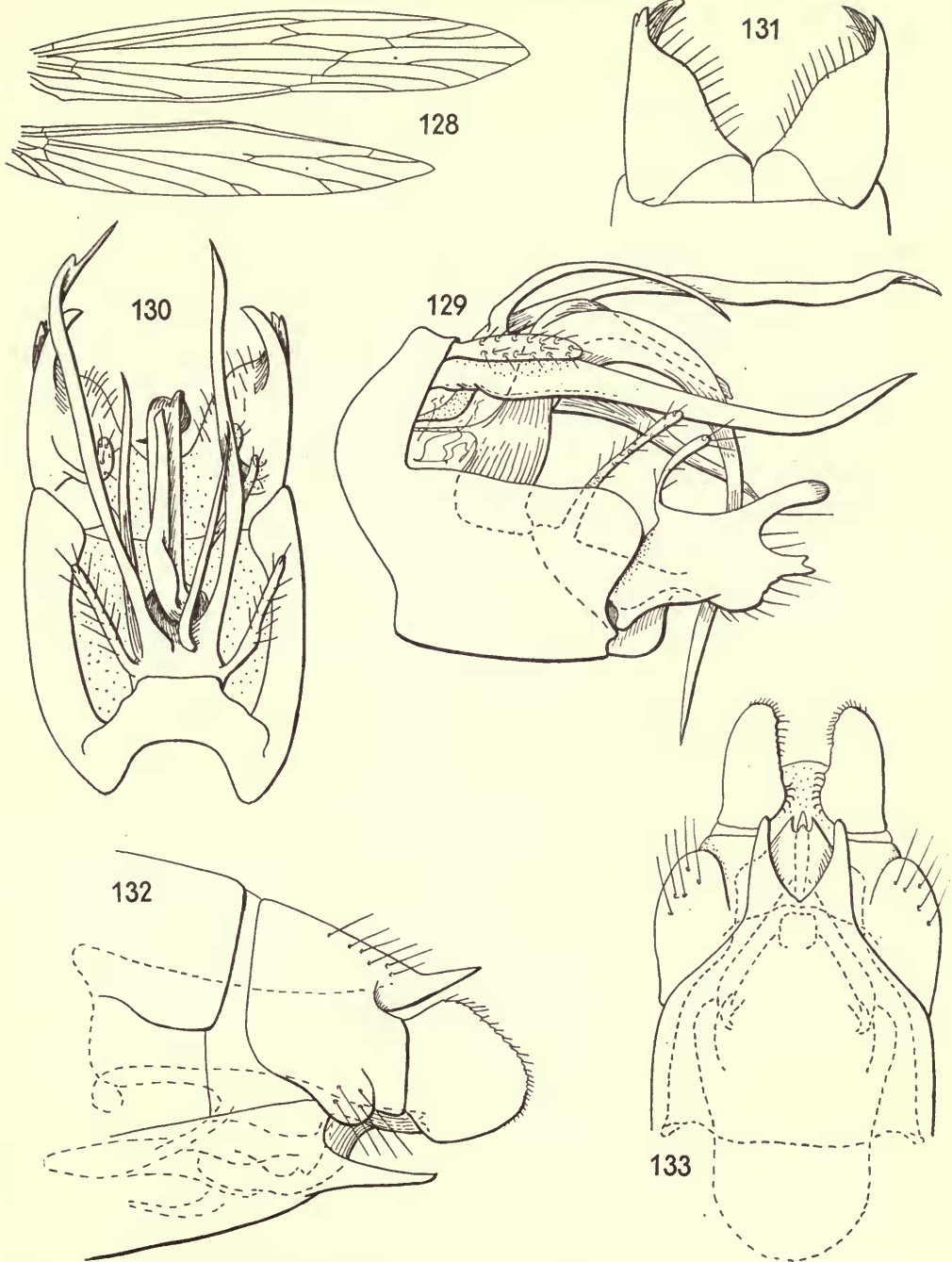
Length of fore wing, ♂, 4.8 mm., ♀, 4.7 mm.

Holotype ♂, Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961 (*A. Tjønneland*), BMNH, mounted as microscope preparations.

Allotype ♀, Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961 (*A. Tjønneland*), BMNH, in 2% formaldehyde solution, abdomen mounted as microscope preparation.

Paratypes, Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961, 12 ♂, 8 ♀ (*A. Tjønneland*), BMNH, UCAA.

This species is closely related to *T. tjønnelandi* sp. n. and had there been only a single male available, one might perhaps have considered it as a variation of that species. Since there are also differences in the female sex, it seems preferable to treat the Ghibe River specimens as a distinct species. The differences between the two are detailed in the above description.



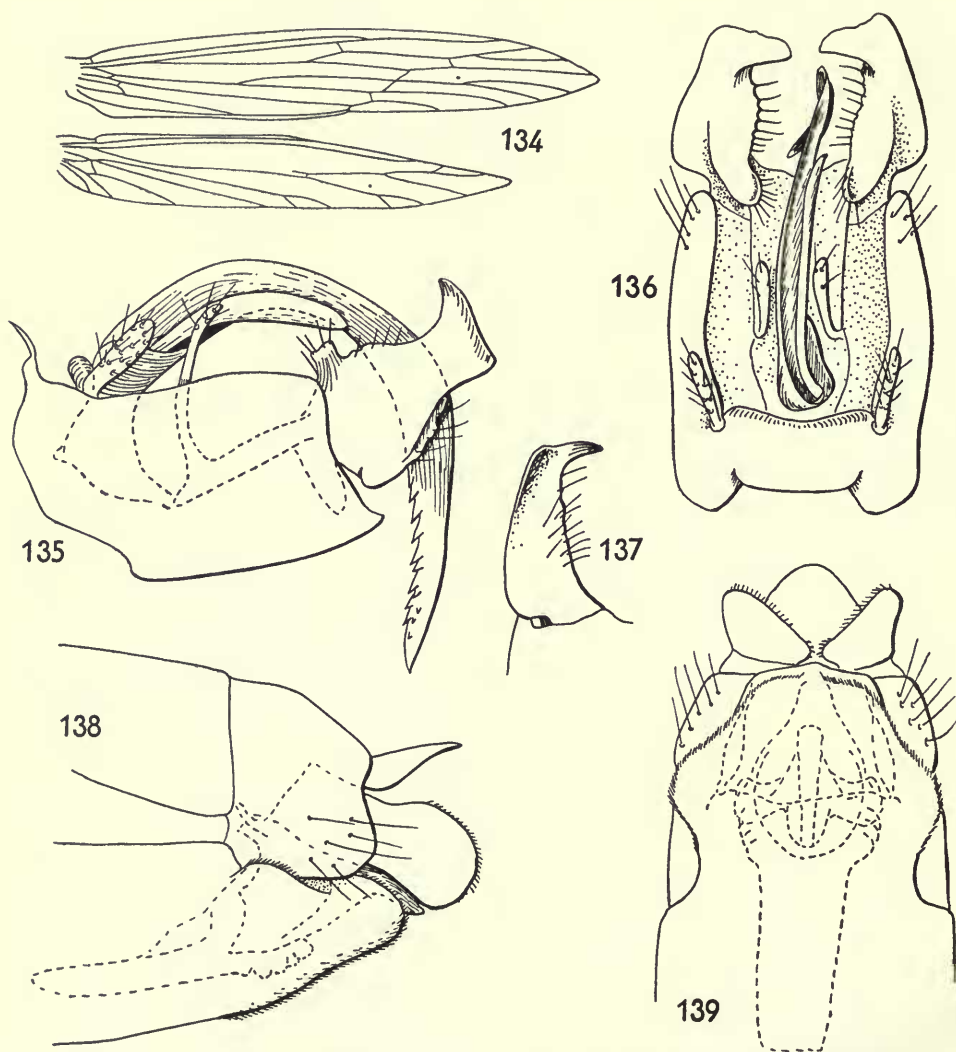
FIGS. 128-133. *Trichosetodes similis* sp. n. 128, ♂ wings; 129, ♂ genitalia, lateral; 130, the same dorsal; 131, ♂ claspers, ventral; 132, ♀ genitalia, lateral; 133, the same, ventral.

*Trichosetodes truncata* sp. n.

(Text-figs. 134-139)

Insects collected in alcohol and much denuded. Yellowish brown, head and thorax with traces of a silver line on inner side of basal segment of antenna and of two longitudinal lines of silver scale-like hairs. Wings pale fuscous, with traces of white or silver longitudinal streaks.

♂ GENITALIA. Ninth segment cut back dorsally to a narrow transverse band, its posterior margin extended upwards in a thin transverse plate. Apical margin of ninth sternite with a small, median excision. Tenth segment reduced to a transverse rib, carrying the short, laterally



FIGS. 134-139. *Trichosetodes truncata* sp. n. 134, ♂ wings; 135, ♂ genitalia, lateral; 136, the same, dorsal; 137, ♂ left clasper, ventral; 138, ♀ genitalia, lateral; 139, the same, ventral.

compressed cerci. There are no processes arising from the tenth segment. Aedeagus long, laterally compressed into a curved, sword-like structure, arching downwards, its lower margin near the apex strongly serrate. From near its base arises a short, curved spine, running adjacent to the main structure. Clasper short, stout at base, with a small, quadrate lobe on its upper margin near the base. The clasper tapers to near the apex, which is truncate and with the upper angle extended upwards and inwards in a stout spine.

♀ GENITALIA. Eighth sternite produced in a large subgenital plate, extending beyond the ninth tergite, broad at its base, tapering to a truncate apex, the whole surface densely set with minute setae. Ninth tergite with rounded lateral angles. Lateral gonapophyses rounded in side view, slightly constricted basally, ventral angles internally with a group of stout setae. Tenth tergite with apical margin parabolic. Vaginal structure as figured.

Holotype ♂, Koka Dam, 29.iii.1961 (*A. Tjønneland*), BMNH, mounted as microscope preparations.

Allotype ♀, Koka Dam, 29.iii.1961 (*A. Tjønneland*), BMNH, in 2% formaldehyde solution, abdomen mounted on holotype slide.

Paratypes, Koka Dam, 29.iii.1961, 2 ♂, 2 ♀; Sokorro stream, Wodorro village, 22-23.iv.1961, 1 ♀ (*A. Tjønneland*), BMNH, UCAA.

This species differs from most of the described species of *Trichosetodes* in the absence of any spiniform processes in the tenth tergite, and in this respect resembles *T. meghawanabaya* Schmid (Ceylon), which also has the aedeagus serrate apically and the basal dorsal margin of the ninth segment elevated in a thin transverse plate. It differs from the Ceylanese species in the form of the clasper, and in the shorter, stouter cercus. In the female the entire apical margin of the subgenital plate distinguishes it from that in *T. anysa*, *T. tjønnelandi* and *T. similis*, where it is excised.

### *Trichosetodes lacustris* ? Kimmins

*Trichosetodes lacustris* Kimmins, 1953 : 278, figs. 7-8.

*Trichosetodes victoriana* Kimmins, 1956 : 139-141, fig. 15.

*Trichosetodes lacustris* Kimmins, 1957 : 36.

Ghibe River, 215 km. from Addis Ababa, 13-14.v.1961, 1 ♂ (*A. Tjønneland*).

This specimen is placed here with some doubt, pending the capture of more material. It differs in some respects from both *lacustris* and *victoriana*, but in view of the variability already observed in *lacustris*, it seems desirable to place this specimen provisionally as a variety of *T. lacustris*.

### *Leptocerus* sp.

Sokorro stream, Wodorro village, 22-23.iv.1961, 1 ♂, 1 ♀ (*A. Tjønneland*).

The male clearly belongs to the *intricatus*-group and is rather like *L. rectus* Kimmins. In view of the limited material, it seems wiser not to express an opinion as to its identity. Several species have already been described in this group, differing chiefly in the shape of the male claspers, and more material from each locality is desirable to determine the degree of variability.



## Family LEPIDOSTOMATIDAE

*Goerodes scotti* (Ulmer)

*Crunoeciella scotti* Ulmer, 1930 : 497, figs. 20-22.

Gamo Prov., Bonghé, Gughé highlands, c. 9,000 ft., 29.xii.1948, 1 ♂, 1 ♀ (*H. Scott*) ; Wondo Abella, 24.iv.1960, 1 ♂ (*A. Tjønneland*) ; Dire Dawa distr., 5,000-8,000 ft., 1961, 3 ♂, 1 ♀ (*B. G. Hill*).

Previous distribution : ETHIOPIA.

## LIST OF ETHIOPIAN TRICHOPTERA

\* = Species recorded by Ulmer, 1930

*Distribution outside Ethiopia*

## PHILOPOTAMIDAE

- \**Chimarra abyssinica* Banks  
*lejea* Mosely  
*triangularis* sp. n. Aden, Yemen

## POLYCENTROPODIDAE

- Dipseudopsis capensis* Walker African

## PSYCHOMYIIDAE

- Ecnomus thomasseti* Mosely African  
*ugandanus* Kimmins Uganda, Tanganyika  
*hilli* sp. n.  
*similis* Mosely S. Africa, Nyasaland  
*Psychomyiellodes excavata* sp. n.  
*obscura* Kimmins Uganda, Rhodesia  
*Abaria electa* Marlier Congo

## HYDROPSYCHIDAE

- Amphipsyche senegalensis* (Brauer) African  
*instabilis* sp. n. Rhodesia  
*fuscata* sp. n.  
*Cheumatopsyche sexfasciata* (Ulmer) W. Africa  
\* *bimaculata* (Ulmer)  
*albomaculata* (Ulmer) W. Africa  
*simplex* sp. n.  
\* *obscurata* (Ulmer)  
\* *falcifera* (Ulmer) E. Africa  
*nubila* sp. n. S. Africa  
\* *afra* (Mosely) African  
*Hydropsyche propinqua* Ulmer Cameroons  
*abyssinica* sp. n.  
*Diplelectronella ? afra* Mosely

## LEPTOCERIDAE

- Pseudoleptocerus schoutedeni* Navás  
    *corbeti* Kimmins  
\**Triaenodes triaenodiformis* (Ulmer)  
    near *elegantula* Ulmer  
*Parasetodes sudanensis* Ulmer  
*Athripsodes fissa* (Ulmer)  
    *jinjana* Kimmins  
    *niveosquamosa* sp. n.  
*Leptocerina* r. *ramosa* (Ulmer)  
    *spinigera* Mosely  
    *talopa* Mosely  
*Tagalopsyche aethiopica* sp. n.  
*Oecetis pangana* Navás  
    *setifera* Ulmer  
\*    *montana* Ulmer  
    *tjonnelandi* sp. n.  
    *brunnescens* (Ulmer)  
    *ghibensis* sp. n.  
    *brevis* sp. n.  
*Setodes aethiopica* sp. n.  
    *pallida* sp. n.  
    *squamosa* Mosely  
*Trichosetodes tjonnelandi* sp. n.  
    *similis* sp. n.  
    *truncata* sp. n.  
    ? *lacustris* Kimmins  
*Leptocerus* sp.

C. Africa, Sudan  
Uganda  
N. Rhodesia  
Sudan, Uganda, Mozambique, Katanga  
African  
Uganda  
Cameroons  
W. Africa  
Uganda  
Congo, Senegal  
Sudan, L. Nyasa, L. Victoria  
Sudan  
Natal

## LEPIDOSTOMATIDAE

- \**Goerodes scotti* (Ulmer)

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